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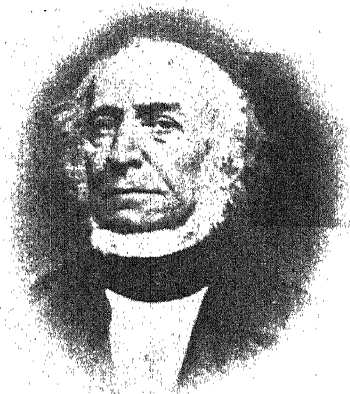
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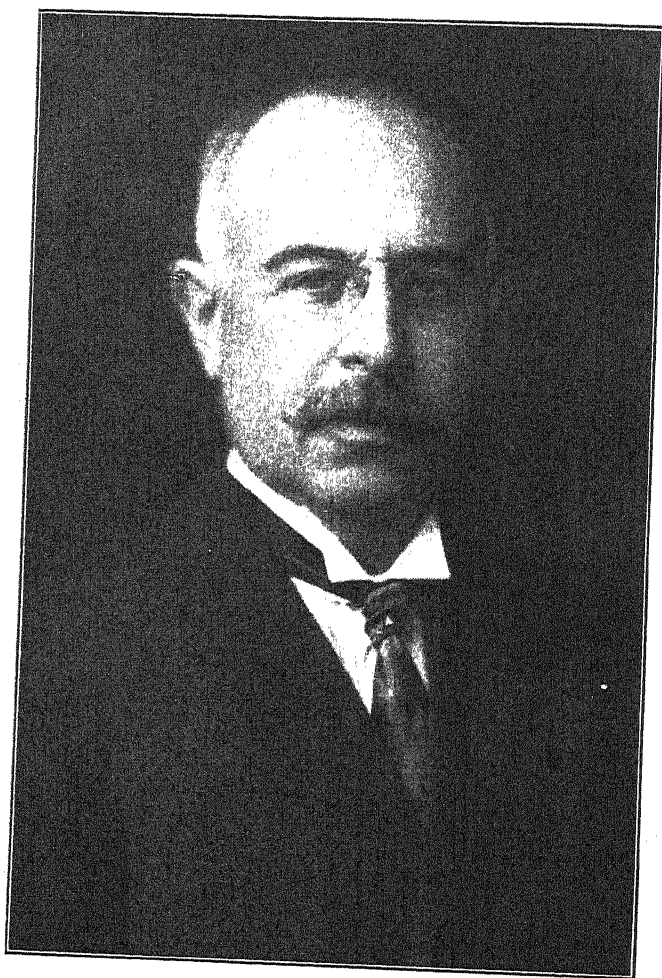
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HENRY SKINNER, M.D., EDITOR EMERITUS. 1910.

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AND

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Editorial Changes.

(Plate I)

On the thirteenth of October, nineteen hundred and ten, the Chairman of the joint Publication Committee of the Entomological Section of the Academy of Natural Sciences of Philadelphia and of the American Entomological Society, having in charge ENTOMOLOGICAL NEWS, received the following letter:

"Philadelphia, Oct. 12th, 1910.

"MR. E. T. CRESSON,

"Chairman Publication Committee.

"DEAR MR. CRESSON:

"I hereby tender my resignation as editor of ENTOMOLOGICAL NEWS to take effect December fifteenth, 1910. At that time, if I am alive, I will have served twenty-one years as editor of the journal, and the NEWS may be considered to be of age and over the nursing period. I will still have a warm interest in its welfare, and will do what I can to make its future a success. I suggest that you call a meeting of your Committee in the near future for the purpose of selecting an editor and an associate editor.

"Very sincerely,

"HENRY SKINNER."

The Committees held a meeting on October twenty-seventh and, knowing that it had been Doctor Skinner's intention for many months past to lay down his editorship, accepted his resignation, and elected him Editor Emeritus. Dr. Philip P. Calvert, associate editor since January, 1893, was chosen editor and Mr. E. T. Cresson, Jr., associate editor. To the vacancy created in the Advisory Committee by Mr. Cresson's election as associate editor, Mr. Erich Daecke was chosen.

The new editors think that they may fittingly present to their subscribers and readers at this time a portrait and brief sketch of the Editor Emeritus to whom this journal is chiefly indebted for its past life.

Henry Skinner was born in Philadelphia, March 27, 1861. He studied in the college and medical school of the University of Pennsylvania, receiving his M.D. degree in 1884. He engaged in the practice of medicine until 1901, when he devoted his whole time to entomology, becoming in that year an assistant to the Curators of the Academy of Natural Sciences, in charge of the Entomological department of that institution. Previously, from December, 1889, on, as Curator of the American Entomological Society and Custodian of the Entomological Section of the Academy, he had given only a part of his time to the care of the collections of insects.

ENTOMOLOGICAL NEWS was begun with the number for January, 1890, with Eugene M. Aaron as editor and an Advisory Committee consisting of Messrs. George H. Horn, M.D., Ezra T. Cresson, Henry Skinner, M.D., and Philip P. Calvert. With the number for March, 1890, Dr. Skinner began his editorial connection with this journal which he has now loosened, but not severed. Volume I of the News comprised 168 pages and no plates; Volume XXI, 484 pages and 14 plates, an increase for which we thank our numerous friends and supporters of the past score of years.

May they continue to give us the support which they have given to our Editor Emeritus. May he enjoy many years of health and strength and the happiness of seeing his "nursling" grow and prosper!

A New Hesperid.

By KARL R. COOLIDGE and VICTOR L. CLEMENCE.

Achalarus pseudocellus, spec. nov.

♂. Upper surface of primaries, brownish-black, somewhat lighter along the external margin, and sparsely dusted with whitish atoms; a macular band extending from costa across end of cell and abruptly terminating about 2.5 mm. from lower angle; this band is divided by the nervules into five spots as follows: first, quadrate; second, elongate; third, with the nervules, y-shaped, and projecting outwardly; fourth, quadrate; and the fifth, triangular; the formation of this band is similar to that of *cellus* and is quite regular, the fifth spot, however, varying considerably in size and shape; color of first spot, pure yellow; the second, orange, slightly tinted with yellow anteriorly; the others all orange; midway between this band and the apex a small procurved whitish-yellow bar; otherwise immaculate. Secondaries concolorous with primaries, immaculate. Fringes of primaries at lower angle whitish, becoming black checkered as they approach the apex, where there is usually a distinct whitish patch of fringes. Fringes of secondaries checkered black and gray. Primaries beneath with spots reproduced; color as above but considerably lighter along outer margin and dusted sparsely with grayish scales; inner angle clouded with buff; in some specimens a distinct whitish point below bar of costa, and in others another similar point immediately outward of end of costal bar; one or both of these may reappear faintly on the upper surface. Secondaries beneath brownish; two irregular, wavy dark brown bands, heavier than the ground color; between these bands and along the outer margins the coloration is pallid; scattered gray scales, heavier at anal angle than elsewhere. Fringes of primaries beneath as above; on secondaries the fringes are brownish, the whitish of above being greatly diminished. Antennae brown, with a white color at base of club; beneath whitish-yellow; thorax and abdomen dark brown; palpi yellowish-gray.

Expanse.—1.30 to 1.50 inch.

♀.—We do not discover any essential differences in the female, either as to size or ornamentation.

Type Loc.—Ramsey Canon, Huachuca Mountains, Cochise County, Arizona. 5,000—7,000 feet altitude.

Described from 2 ♂♂ and 2 ♀♀ types in the collections of Coolidge and Clemence, and from 67 co-types, five of these in the collection of Dr. Barnes.

Our first specimens of *pseudocellus* were taken on June 7th, and from then on until July 10th it was on the wing in abundance. *Cellus* first appeared about the middle of June, but was not plentiful until July. We at once noted that there were two distinct species, and upon careful examination we found very striking characters. The white color at the base of the club in the new species is distinctive, and the undersides of the secondaries are not flecked with the prominent blue metallic scales of *cellus*. *Pseudocellus* is also of a considerably smaller size, although varying somewhat. The band of the primaries above in *cellus* is clear yellow, but orange in *pseudocellus*. The fringes of the upper surface of the secondaries in *cellus* are yellow, but gray in *pseudocellus*. The above differences will at once serve to distinguish the two species. Moreover, Dr. William Barnes writes us that, "We have looked over our box of *cellus*, and find that we have about one hundred of the large form and thirty or forty of the smaller. Have series of each and find they are very uniform. There is no doubt but there are two species, and I think without doubt the larger one is *cellus*, as it agrees quite well with the figure of Boisduval and Leconte, and we can go no further as there is no description."

Dr. J. McDunnough has very kindly examined and drawn the genitalia of both species, and we find them to be obviously different. We shall deal with this in a future article. He also writes that a specimen of *pseudocellus* in the Barnes collection bears the label, "W. Va." while all the others are from Arizona. It is rather astonishing that such a striking species should so long have escaped notice.

Messrs. E. A. Schwarz and August Busck, of the Bureau of Entomology, U. S. Department of Agriculture, will leave for Panama in January to search for parasites of the citrus white fly (*Aleyrodes citri*) and the cotton boll weevil and allied species, and to make a study of the entomological fauna of the canal zone.

Orthoptera found about Aweme, Manitoba.

JAMES A. G. REHN AND MORGAN HEBARD.

During the season of 1909 the following series of Orthoptera was taken by Mr. Norman Criddle, and is now in the collection of the junior author, with the exception of sets from the larger series, which are in the collection of The Academy of Natural Sciences of Philadelphia. A collection was also made by Mr. Criddle for Dr. E. M. Walker, and the records have been published in the Canadian Entomologist, Volume XLII, Nos. 8, 9, 10 and 11.

Dr. Walker records the following species from Aweme, which are not in our series:—*Labia minor* (L.), *Tetrix ornatus* (Say) *Cordillacris cinerea* (Brun.), *Philobostroma quadrimaculatum* (Thom.), *Encoptolophus parvus* Sc., *Camnula pelucida* (Sc.), *Hippiscus neglectus* (Thom.), *Scudderia curvicauda* (DeG.), *Idionotus brevipes* Caud., *Udeopsylla nigra* Sc., and *Oecanthus nigricornis quadripunctatus* Beut.

The species in our series not before recorded from Aweme are as follows: *Akentetus unicolor* McN., *Mecostethus lineatus* (Sc.), *Melanoplus femur-rubrum* (DeG.), *Melanoplus packardii* Sc., *Melanoplus luridus* Dodge, *Melanoplus bivittatus* (Say), *Conocephalus saltans* Sc. Of these *Melanoplus luridus* Dodge is recorded from Western Canada for the first time; *Akentetus unicolor* McN. and *Melanoplus packardii* Sc. are first records for Manitoba.

The notes on habitat have been supplied by Mr. Criddle.

Acrydium granulatum Kirby.

June 3; 2 ♂.

Acrydium acadicum (Sc.)

June 2, 3, 4; 2 ♂, 5 ♀. 3 in dry woodland, 1 in damp open woods.

Acrydium hancocki (Morse).

June 2, 4; 2 ♀. 1 damp open woods; 1 in dry woodland.

Akentetus unicolor McNeill.

Aug. 22; 1 ♀. On dry prairie. This species has formerly

been recorded from but one Canadian locality, Walsh, Saskatchewan. There is no trace of rudimentary accessory lateral carinae of the pronotum.

Amphitornus coloradus (Thom.)

Aug. 22; 1 ♂, 7 ♀. Grass prairie land.

Chloealtis abdominalis (Thom.)

July 29; 1 ♂; Aug. 3; 1 ♂; Sept. 15, 29; 1 ♂, 3 ♀. One specimen was taken in meadowland, the rest from the prairie. This species appears late in the season; July 29 is the earliest date among numerous records given by Dr. Walker for the capture of an adult. The junior author also found that at Pequaming, Michigan, the species did not appear until August.

Chorthippus curtipennis (Harr.)

Aug. 3, 9, 18, 21, 27, 29; 16 ♂, 10 ♀; Sept. 25; 5 ♂, 7 ♀. The series was taken in meadowlands. 3 ♂ and 6 ♀ only, have long wings; but two specimens have the lateral lobes of the pronotum distinctly green.

Gomphocerus clavatus Thom.

June 29; 1 ♂; July 10; 1 ♂, 1 ♀; Aug. 3, 22, 25; 1 ♂, 5 ♀. Four specimens were taken in damp meadowlands, the rest on the dry prairie.

Stirapleura decussata Sc.

June 7, 9; 3 ♂, 3 ♀; July 9, 21, 29; 1 ♂, 7 ♀. The specimens were taken on dry sandy land and on a dry hillside.

Ageneotettix deorum Sc.

Syn.—*A. scudderi* (Brun.)

Aug. 22; 4 ♂. Taken on the dry prairie. The *Eremnus scudderi*, recorded by Dr. Walker, is based solely on McNeill's combination of these names. The genus *Eremnus*, as later shown by McNeill, is invalid and must be replaced by *Ageneotettix*.

Mecostethus lineatus (Sc.)

Aug. 30; 1 ♂. Meadow. This is the first definite Canadian record for this species.

Mecostethus gracilis (Sc.)

Aug. 9, 18, 19, 30; 7 ♂. Damp meadowland.

Arphia frigida (Sc.)

May 16, 1 ♀; June 2, 3, 4, 7, 9, 19, 21, 23, 24, 25, 29; 20 ♂, 19 ♀; July 1, 29; 3 ♂, 2 ♀. As in Dr. Walker's series from Saskatchewan, these specimens exhibit a great variability in the color of the wings. The great majority of the specimens are yellow-winged; one specimen has wings of quite as deep a shade of red as *A. pseudonictana*, while specimens having wings of a color intermediate between these two types number quite a few. The yellow sutural stripe of the tegmina is present in but two specimens.

Arphia pseudonictana (Thom.)

Aug. 13, 18, 27, 30; 5 ♂, 3 ♀. Sept. 6, 30; 2 ♂, 1 ♀. All taken on the prairie.

Hippiscus tuberculatus (Pal. de B.)

May 26, 1 ♂; June 3, 5, 9, 10, 19, 21, 23; 9 ♂, 5 ♀. Labelled: damp meadow, near woods, dry land, open meadow in woods.

Hippiscus maculatus Sc.

June 2, 9, 19, 23; 7 ♂, 5 ♀. Labelled: dry prairie, dry sandy hill, dry sandy land. All the specimens before us have the disc of the wing very pale lemon yellow, with the exception of one male which has that part of the wing colored pale salmon pink. With the small amount of material at hand we are unable to decide the validity of the several closely allied species: *Hippiscus maculatus*, *tigrinus*, *latifasciatus* and *zapotecus* (?). The series before us belongs assuredly to but one species; we have used the name "*maculatus*" as the specimens agree with the description of that species, and of the species above mentioned this name has priority of date. As Dr. Walker has mentioned in his recent paper, Scudder's characters for this genus are almost wholly useless, and, in consequence, it probably contains numerous synonyms.

Dissosteira carolina (Linn.)

July 30, 2 ♂, 1 ♀. All taken on a sand bank.

Spharagemon collar (Sc.)

Aug. 18, 27, 30; 11 ♂, 10 ♀; Sept. 6, 1 ♂; Oct. 1, 2 ♂. Few of this series have the collar of the pronotum marked lighter than the general color of the insect. All taken on the prairie, many in sandy situations.

Spharagemon bolli Sc.

July 26, 1 ♂; Aug. 19, 1 ♀. Both specimens captured on the prairie.

Mestobregma kiowa Thom.

July 26, 29; 12 ♂, 5 ♀; Aug. 3, 26; 1 ♂, 1 ♀. All taken on dry hillsides and prairie land.

Trimerotropis agrestis McN.

Aug. 22; 17 ♂, 8 ♀. All taken in drifting sand.

Circotettix undulatus Thom.

July 25, 26; 2 ♂, 3 ♀; Treesbank, Manitoba. The specimens were taken on a sand beach.

Melanoplus atlanis Riley.

July 10, 13, 14, 15, 16, 24; 10 ♂, 9 ♀; Aug. 11, 14, 18; 5 ♂, 3 ♀; Sep. 15, 16, 18, 25; 4 ♂, 1 ♀; Oct. 1; 2 ♀. All but six specimens of this series of thirty-four, have the caudal tibiae colored pale glaucous. Taken in dry fields, cultivated land, low lands and on the sandy prairie.

Melanoplus dawsoni (Sc.)

Aug. 3; 1 ♀; Sep. 15, 29; 3 ♂, 1 ♀; Oct. 1; 3 ♂, 2 ♀. The series was captured on the dry prairie, on the edge of wet land and in meadowlands. All are brachypterous.

Melanoplus gladstoni Sc.

Aug. 15, 21, 22, 23; 6 ♂, 3 ♀; Sep. 15, 16, 18, 25, 29; 3 ♂, 6 ♀; Oct. 1, 2, 3; 3 ♂, 3 ♀. Almost the entire series was captured on the prairie. A very few specimens were taken in the dry scrub and in damp meadow lands.

Melanoplus femur-rubrum (DeG.)

Aug. 30; 1 ♀. In meadow.

Melanoplus extremus (Walk.)

July 1; 1 ♀. In damp meadow. In this individual the tegmina extend to the base of the genicular arch.

Melanoplus angustipennis (Dodge).

July 14, 15, 19; 4 ♂, 1 ♀ : Aug. 15; 4 ♂, 2 ♀ : Sep. 8, 16; 2 ♂, 2 ♀ : Oct. 1, 6; 8 ♂, 1 ♀. Captured in the following localities: dry field, dry edge of bush, low open bush, prairie, damp meadow, edge of wood. The low bush land seems to be the favorite habitat of this species. All the specimens in this series have red tibiae.

Melanoplus packardii Sc.

July 14, 15; 4 ♂, 9 ♀. All taken in a dry field.

Melanoplus minor (Sc.)

June 22, 23; 1 ♂, 1 ♀. The male was captured on dry land, the female in a damp meadow.

Melanoplus luridus (Dodge).

Aug. 3, 15, 30; 2 ♂, 1 ♀ : Sep. 16; 1 ♀. Taken in low open bush, dry field and dry sandy land.

Melanoplus bivittatus (Say).

July 14, 15; 2 ♂, 1 ♀ : Aug. 19, 30; 5 ♂ : Oct. 1, 6; 4 ♂. This series was captured in meadowlands and cultivated areas.

Scudderia pistillata Brunn.

Aug. 8, 9, 11, 14, 18, 19, 21, 22, 23, 27; 11 ♂, 5 ♀. Labelled; in meadowland, in high weeds in meadow, among sandy hills, in dry bushy land; the last situation being apparently preferred by this species.

Conocephalus fasciatus (DeG.)

Aug. 21, 22; 1 ♂, 8 ♀, 1 nymph. All taken in meadowland.

Conocephalus saltans (Sc.)

Aug. 3; 1 ♂, 1 ♀. Taken on the prairie.

Anabrus simplex Hald.

July 18, 23; 4 ♂. Captured on the prairie.

Gryllus pennsylvanicus form neglectus Sc.

June 21; 3 ♂, 2 ♀ : Sep. 12, 13, 22, 23; 5 ♂, 2 ♀.

♀	Caudal Femur.	Ovipositor.
June 21	9.5 mm.	11
June 21	9.5 mm.	11
Sep. 12	9.5 mm.	16.5
Sep. 23	10 mm.	17

Nemobius fasciatus form *abortivus* Caud.

Sep. 22; 4♂ : Oct. 5, 6; 3♀. The series was collected in meadowlands.

Length, elytra, male, 4 to 4.5 mm., female 3 to 5 mm., posterior femora, male 4.5 to 5 mm., female 5.2-6 mm., ovipositor, 5 to 8 mm. Two of the females have short rounded tegmina, these two have ovipositors 5 and 7 mm. in length.

A New *Lestodiplosis*.

By E. P. FELT, Albany, N. Y.

The species described below was reared by Mr. C. H. T. Townsend of Piura, Peru, from *Hemichionaspis minor* Maskell, and submitted to the author for determination through Dr. L. O. Howard, Chief of the Federal Bureau of Entomology.

Lestodiplosis peruviana n. sp.

Male.—Length, 1 mm. Antennae twice the length of the body, rather thickly haired, yellowish, the basal nodes of the flagellate segments slightly fuscous; fourteen segments, the fifth having the two portions of the stem, each with a length about three and one-half times the diameter, the basal enlargement subglobose, with a sparse sub-basal whorl of long, stout setae and a well developed circumfilum, the loops of the latter extending nearly to the base of the distal enlargement, which latter is pyriform, has a length one-half greater than its diameter, a sparse whorl of long, stout setae and basal circumfilum with rather short loops; the distal node with loops reaching nearly to the apex of the segment; terminal segment having the basal portion of the stem with a length six times its diameter, the distal enlargement subcylindric with a length three times its diameter and narrowly rounded apically. Palpi; first segment probably quadrate, the second rectangular, with a length over twice its diameter, the third as long as the second, more slender, the fourth one-half longer than the third, more slender. Face probably yellowish. Mesonotum pre-

sumably light brown, the submedian lines sparsely haired. Scutellum and post-scutellum presumably yellowish. Abdomen sparsely haired, apparently yellowish, with a fuscous spot basally. Wings faintly spotted near the middle of the third vein and along the branches of the fifth; subcosta uniting with costa near the basal third, the third vein just before the apex, the fifth at the distal fourth, its branch near the basal half. Halteres yellowish, reddish orange subapically. Coxae yellowish; femora, tibiae and tarsi a variable fuscous straw; claws slender, evenly curved, simple, the pulvilli nearly as long as the claws. Genitalia; basal clasp segment long, slender, with a small, triangular lobe at the internal basal angle; terminal clasp segment somewhat swollen basally; dorsal plate long, deeply and triangularly emarginate, the lobes rounded and sparsely setose; ventral plate probably broadly rounded, setose. Other structures indistinct.

Larva.—Length, 1.5 to 2 mm.; probably yellowish orange. Head long, tapering to a narrowly rounded apex. Antennae slender, tapering and with a length nearly twice the diameter of the head; breast-bone apparently wanting, ocular spot indistinct. Skin finely shagreened, the segments dorsally, each with subdorsal, sublateral and lateral setae near the anterior third, the longest having a length equal to about half the body diameter; terminal segment reduced, with a diameter about half that of the preceding segments and distally with a median, rounded process. Conical, fleshy prolegs occur on body segments 2-10.

The above descriptions were drafted from balsam mounts and the color characteristics as a consequence are hardly those of the living insect.

A Day with *Euchloe cethura*.

By KARL R. COOLIDGE.

Euchloe cethura, a butterfly confined to Southern California, is a much to be desired prize. About Pasadena we looked for it minutely, but always without success, and it seems at the present time to have disappeared. In former years, however, it was taken here in considerable numbers and is said to have been abundant at Elysian Park, between this city and Los Angeles.

Learning that it occurred quite commonly in the vicinity of San Bernardino, we decided to pay a visit there in quest

of the little beauty, and incidentally pay our respects to Mr. William Greenwood Wright, the pioneer Lepidopterist and author of the "Butterflies of the West Coast." March 6th found Pasadena wrapped in a dense fog, and for a time we feared that our prospects were very meagre. However, after an hour's ride from Pasadena, passing through mile after mile of citrus groves, we were greeted by the sun shining forth unhindered by fog or clouds. San Bernardino, with its snow capped mountains looming up behind it, was reached about ten, and we proceeded at once to F Street, where we were fortunate in finding Mr. Wright at home. Hearing we were fellow "bugologists" he greeted us with open arms and devoted himself entirely to our entertainment. Several hours was spent in looking over his valuable and extensive collections, with exception of his types which he has wisely placed in safe storage. Then, hitching up "the old hoss shay," we drove to Little Mountain, about two miles to the north of the city, accompanied by our host, who assured us we would be successful. After a hard scramble we reached the summit, and Mr. Wright, though he must be well along in the sixties, kept pace with us, giving one of the best illustrations of what the study of entomology accomplishes for her students, perfect health in old age.

In less than half an hour our first *cethura* was bagged, and before the day's hunt was over, seven more fell victims to our butterfly nets. One of the specimens taken is typical of *E. cethura deserti* which Mr. Wright, in his Butterflies of the West Coast, describes as a desert form of *cethura*. It seems, however, to be but an individual variant. Little attention was paid to other species, but occasionally a specimen reached the "Happy Flying Grounds" via the unlimited Cyanide Route. *Thecla dumetorum* was in its prime, flying in large numbers, and *T. iroides* was not uncommon. Up on the summit the little *Alypia ridingsii* gyrated about and we could have taken a large series had we so desired. Now and then the swift *Colias eurydice* whizzed by, and a stray *Papilio zoli-*

caon flew lazily about. *Thanaos juvenalis* we found abundant, and several early *Melitaca wrightii* and *M. augusta* were netted. The everywhere *P. rapae*, *E. sara reakirti* and others were noticed. We had an additional pleasure in having the exact type localities of *Melitaca wrightii*, *M. augusta* and *M. cerrita* pointed out to us.

About three o'clock our appetites got the best of us, and in a half falling-sliding manner we returned to the buggy, where cold chicken, pie, and other related species of edibles awaited us. Needless to say, we were quite as successful with these as we had been with the butterflies. Still another pleasant hour remained before our train pulled out, and we found the time all too short. Mr. Wright ceremoniously labeled the day "Cerrita Day," after *M. cerrita*, over whose type locality we had sacrilegiously tramped. The laws of nomenclature compels us, to our regret, to change the name to "Wrightii Day," perhaps more appropriate, as *cerrita* was taken in company with and appears to be but an extreme aberration of *M. leanira wrighti* Edwards.

Truly, we shall look back with pleasure to "Wrightii Day"—our first introduction to the dainty *Euchloe cethura*, and to William Greenwood Wright, one of the few men now living who had for his contemporaries and friends such men as Wm. H. Edwards, Henry Edwards, Samuel H. Scudder, Hermann Strecker, and Dr. Behr.

Euchaeria socialis—The larval nest of this interesting species, closely allied to our *Neophasia*, is put to a curious use by the Mexicans in the Sierra Madres of Sonora. The nest, being of a tough and leathery texture, is deprived of its occupants and becomes metamorphosed into an excellent tobacco pouch. Many a señor, señora and dark-eyed señorita defty roll their cigaritos from species of "My Lady Nicotine" drawn from plundered larval nests of *E. socialis*.

The Trustees of the Mass. Agric. College dedicated the new building for Entomology and Zoology Friday, Nov. 11, 1910, at Amherst, Mass.

Standards of the number of eggs laid by Insects—IX.*

Being Averages Obtained by Actual Count of the Combined Eggs
from Twenty (20) Depositions or Masses.

By A. ARSÈNE GIRAULT.

13. BLATTELLA GERMANICA Linneus.							
No.	Date 1910	No. counted per mass	Successive Totals	Av. per Egg Mass	Max. Min.	Range	
1	Sep. 20	38	38	38	48		
2		40	78	39			
3		40	118	39.3			
4		40	158	39.5			
5		48	206	41.2			
6		38	244	40.6			
7		42	286	40.8			
8		44	330	41.2			
9		38	368	40.8			
10		42	410	41.			
11		40	450	40.9			
12	Oct. 1	42	492	41.	34		
13		36	528	40.6			
14		38	566	40.4			
15		39	605	40.3			
16		44	649	40.5			
17		44	693	40.7			
18		34	727	40.3			
19		40	767	40.3			
20		44	811	40.5			
			811	40.5	48 34	14	Finals

The egg-capsules used here were taken from living females occurring in a kitchen of a hospital at Dunning (Chicago), Illinois, September 15, 1910; they had all been rotated. When the embryos neared perfectness they were dissected out and counted. This procedure is not necessary, however, for the outline of each egg is well defined exteriorly and their number is easily determined. As a rule there are an equal number of eggs in both sides of any single capsule, hence the even numbers shown in the table.

Wheeler (Journal of Morphology, Boston, III, 1889, p. 292) states that oviposition occurs at all times of the year. The same author (Ib., p. 301) gives the average number of eggs

* For the first eight of this series, see ENT. NEWS, 1901, p. 305; 1904, pp. 2-3; 1905, p. 167; 1906, p. 6; 1907, p. 89; 1908, pp. 4, 383; 1909, pp. 355-357.

in a capsule (taken from 34 specimens) as being near 40 and the range from 28 to 58. "The number varies in different localities and is doubtless dependent on the food of the female insect. In several capsules obtained where amylaceous food was abundant the average was much higher than in a much greater number of capsules obtained from a place where fatty food was the only diet."

In the same place on a later page (p. 302) he again states: "Taschenberg (46) claims that the female regularly lays only one capsule and dies soon after its deposition. My observations on fifty females, whose wings were clipped as soon as they had formed their first capsule, have convinced me that they certainly lay two perfect capsules as a rule, and possibly more, in the course of the year." Wheeler is also certain that the young hatch without assistance from the female a fact easily observed by keeping egg-capsules isolated and protected from dryness. The young escape without difficulty from them.

It follows from what has been written in this connection that the total number of eggs deposited by single females of this species will have to be determined by observation on living females kept under as natural conditions as possible. The number must average at or above 80.

A New American Sitarine Beetle (Col., Lyttid.).

By CREIGHTON WELLMAN, Oakland, California.

The writer recently received for determination from Professor S. J. Hunter, of the University of Kansas, a collection of Lyttidae secured last June by Mr. F. X. Williams, of the same University, in Gove County, Kansas. Among the specimens are a series found by Mr. Williams in bees' nests and which represent an interesting new species described in the following paper.

These insects belong to the genus *Hornia* Riley (hitherto known to contain but a single species) which is the only genus representative of the Sitarini yet found in the western hem-

isphere with the exception of the Old and New Mexican genus *Leonidia* Ckll. (containing two species) from which *Hornia* may be separated by the following table:

1. (2) Antennae of 10 articles, abdomen partly membranous, claws unarmed *Hornia* Riley.
2. (1) Antennae of 10 articles, abdomen entirely subcorneous, claws armed with a long basal spine.....*Leonidia* Ckll.

The new *Hornia* may be characterized as follows:

***Hornia gigantea* n. sp.**

Color, head dark castaneous with irregular ferrugineous markings on the frons and vertex, thorax black clouded with castaneous, scutellum brownish black, elytra transparently ferrugineous the sutural margins slightly infuscate, abdomen with chitinous portions colored much as head and thorax, legs black; *head* broadly triangular, back and sides with black pubescence; *labrum* transverse, somewhat excavated on its upper surface, apically broadly rounded, the free edge thickly fringed with short golden hairs a few of which are paler and subsetaceous, the lateral margins slightly raised, the punctuation finer and thicker towards the center; *clypeus* transverse, anterior border almost straight, sides and posterior border somewhat convex, punctuation rather stronger and more irregular than that of labrum; *mandibles* black, robust, rather sharply truncate; *labial palpi* with last article longer than the other two and fusiform, the extreme apex knobbed; *maxillary palpi* with first article minute, second very long, obconical, third shorter, also obconical, the last rather shorter than preceding, fusiform (slightly obconical) apex broadly and roundly truncate; *antennae* submoniliform, first article shortly subglobose, second similar but smaller, third to tenth gradually becoming more cylindrical and slenderer, last article slightly longer, apically narrowed and truncate, the joint between the tenth and eleventh articles indistinct; *eyes* small; *neck* distinct, head and thorax not closely joined; *pronotum* convex, almost subglobose, narrowed in front and behind, posterior margin everted, pubescence black and most abundant at sides; *scutellum* transverse, roundly triangular, with a few deep punctures; *elytra* irregularly and roundly triangular, ora somewhat raised but not prominent. surface irregularly rugose, with a few erect black hairs; abdomen large, as in *Meloe* L., membranous, nine dorsal and seven ventral chitinous plates obviously visible; *legs* with femora robust, sparsely pubescent, tibiae more strongly pubescent; *tarsi* small, claws slender.

Sexual characters: ♂, the punctuation of the head is sparse, fine and deep, the antennae reach to the middle of the elytra (5.5 mm. in

the type), the thorax is sparsely and finely punctured, a few coarse punctures intermixed in the center of the disk, the eyes are reniform, the scutellum small, the elytra about twice as large as in the ♀, and the front tibiae armed; ♀, the head is more coarsely sculptured, the punctures being larger, thicker and more irregular, the antennae reach not quite to the middle of the thorax (3.5 mm. in type), the thorax is very coarsely and strongly punctured, especially on the anterior portion of the disk, the eyes are longly oval, the scutellum large, the elytra much smaller and more hairy than in the ♂, and the front tibiae unarmed.

Early stages: Exuvia of third larva hairless and unarmed, nymph (almost completely transformed), ♂, much as in imago but not chitimized.

Length, ♂, 19 mm.; *width,* 6.7 mm.; ♀, length, 19 mm.; width, 7.2 mm. (types); extremes, 24x9.5 mm. ♂, 14x5.1 mm. ♀.

Geog. Dist., Gove Co., Kansas (2813 ft.), June, 1910, "parasite in the nests of *Anthophora occidentalis*," 17 specimens (F. X. Williams).

Types (♂, ♀, nymph, larval skin) in the collection of the University of Kansas; *cotypes:* eight in the collection of the University of Kansas, six in the writer's collection.

The variation in the size of the elytra, in the color and in the dimensions of the specimens is considerable. They may be told at a glance from the only other species in the genus (*minutipennis* Rilev) by the marked difference in facies. The following table will facilitate the more exact separation of the two species:

1. (2) Light ferrugineous, head slightly wider than pronotum, which is subparallel at sides *minutipennis* Rilev.
2. (1) Dark castaneous, head almost a third wider than pronotum, which is markedly arcuate at sides..... *gigantea* Wellm.

The species just tabulated represent the extreme of degeneration from parasitic habits as it occurs among the Lyttidae, and Mr. Williams' discovery is most important, suggesting as it does that further careful examination of bees' nests may reveal other striking additions to our coleopterous fauna.

PROFESSOR H. F. WICKHAM, Professor of Entomology at the State University of Iowa at Iowa City, Iowa, wrote in November: "Although entomology is entirely elective here, I have 100 students working at it."

A new Bee from New York State

By T. D. A. COCKERELL, Boulder, Colorado.

I have just received from Dr. E. P. Felt a couple of specimens of *Osmia*, collected at Karner, N. Y., June 24, 1902. Dr. Felt writes that he has reared a parasite from the species, and is anxious to know its name. It proves to be new, and may be described as follows:

Osmia felti n. sp.

♀. Length about 12-13 mm.; head and thorax strongly and closely punctured, dark blue, suffused with green, especially on supraclypeal area, front, mesothorax, scutellums and metathorax; head rather large, broad, cheeks large and swollen; clypeus normal, very densely punctured, with the lower margin black, smooth and shining, straight, without teeth or emargination; mandibles thick, tridentate; antennae black, scape punctured; no distinct malar space; hair of head and thorax above white, with a faint creamy tinge; a little fuscous hair about ocelli; hair of face white, but of clypeus largely or moderately mixed with dark fuscous; lower part of cheeks with some fuscous hair; hair of thorax nowhere mixed with dark, that of pleura, metathorax etc. all white; area of metathorax wholly dull, granular, faintly rugulose at base; tegulae shining piceous; wings strongly brownish infuscated; b. n. going basad of t. m.; legs black, not even the hind coxae metallic; middle femora swollen and obtusely angulate below; hair of hind tarsi dark fuscous; abdomen shining, rather sparsely punctured, dark steel blue, with white hair on first segment, very short thin fuscous hair on the others, and a slight fringe of minute shining hairs (not making a visible band) on the third and following segments; sides with some white hair; ventral scopa black; last dorsal segment with appressed pale yellowish hair.

In all things this is very close to *O. densa* Cresson, but *densa* has much long coarse black hair on the face and front, the dark hair of the abdomen is longer and more evident, while the shining red or pale hair so evident on the middle basitarsus of *densa* is scarcely or not developed in *felti*.

The type locality of *O. densa* is Pike's Peak, Colorado. It extends thence northwestward to Washington State. *O. felti* might be regarded as a geographical race or sub-species, but even so it would deserve recognition.

Mallophaga from Bolivian Birds.

By V. L. KELLOGG and J. H. PAINE, Stanford University, California.

The following determinations and descriptions of new species of *Mallophaga* refer to a small collection of specimens from Bolivian birds in 1901 by the late Perry O. Simons. (This unfortunate collector of birds for the British Museum was murdered by Indians in the Bolivian mountains in 1902 (?))

In Simons' notes the birds are listed only under Bolivian vernacular or descriptive English names, and we are unable to ascribe them with certainty to their proper species. The English names reveal at least their general sort, as duck, humming bird, eagle, etc.

Docophorus laticeps Giebel.

Several specimens from the "white-headed oriole" (Choro, Bolivia, 3500 metres, dry season).

Docophorus communis Nitzsch.

Specimens from "bird" (Choro, Bolivia).

Docophorus fissi-signatus n. sp. (Fig. 1.)

Two females from "desert curlew" (Lagonillas, Bolivia).

This species belongs to Piaget's type *fisignati* from the Spoon bills and Ibises and is the second of this type that we have found on curlews in this country.

Description of female.—Body length, 2.4 mm.; width, 1.06 mm. Signature double. Head: Length, .66 mm.; width, .68 mm.; quite dark in color except for the clypeus; signature double, somewhat lighter in color than the rest of the head except for its two posterior prolongations; margin and space between the portions of the signature transparent. Clypeus truncate; rounded on the angles, sides slightly diverging, suture distinct. The antennal bands extend over half the length of the clypeus. A prominent hair arises just forward of the termination of the antennal band and another shorter one on the margin at the termination of this band; also a short hair near the suture with another long one arising on the dorsal surface further forward; a hair arising from the ventral surface extending beyond

the lateral margin near the center. On the margin just behind the clypeal suture are three rather long hairs, a short one on the base of the trabeculae and a long one on the margin near the basal segment of the antennae. Temples broadly rounded with three long hairs and three short spines; a hair and one spine arising from the prominent eye. Occiput nearly straight, very slightly sinuous; the occipital bands are prominent and are prolonged in the antennae. Second segment of antennae nearly as long as the last three; third shortest; second and third very light in color, the basal and terminal two being somewhat darker.

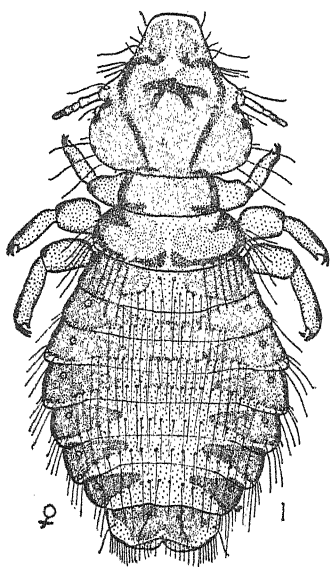


FIG. 1.—*Docophorus fissi-signatus* n.s. ♀ line.

Thorax shorter than head and narrower; length, .4 mm. Prothorax, a trifle less than half that length; quadrangular with a lateral marginal band which also extends along the posterior margin nearly to the center. Median portion of segment light in color. Metathorax with sides diverging, posterior angles broadly rounded and posterior margin convex; a row of pustulated hairs extends around from the straight diverging sides half way to the center of the posterior margin. There are two blotches leaving a narrow uncolored line down the center; darker marginal bands extend from the anterior angles to the median uncolored

Abdomen elliptical with segments of nearly equal length except the ninth, which is very small and bilobed; color pale except for the dark, sharply defined, triangular transverse blotches on the first seven segments which extend in about two-thirds of the way to the center; These segments also have pitchy lateral bands. A spiracle occurs in a clear space on segments two to seven. The eighth segment is dark in color except along the margin; two hairs arise near the center of this segment from clear pustules. The last two segments are rounded, the eighth with straight, almost parallel lateral sides, and a fringe of hairs on the posterior margin. There is a row of hairs across the middle of each of the preceding segments and several in each posterior angle.

Nirmus fuscus Nitzsch.

Several specimens from "hawk" (Cochabamba, Bolivia); also from "hawk" (Charuplaya, Bolivia).

Lipeurus temporalis Nitzsch.

Several specimens from "river duck" (Charuplaya, Bolivia).

Lipeurus epiphanes n. sp. (Fig. 2.)

Male and female from "desert curlew" (Lagonillas, Bolivia).

Description of female.—Body length, 2.88 mm.; width, .56 mm. Head: Length, .6 mm.; width, .34 mm.; conical. Clypeus parabolic in front, sides almost straight and parallel; edge transparent with signature concentric to it; suture distinct; a rather long hair at the

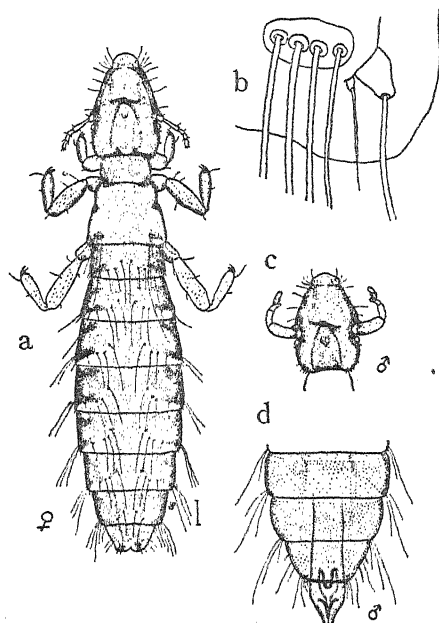


FIG. 2.—*Lipeurus epiphanes* n. sp.—a, female; b, tactile hairs of the postero-lateral angle of the metathorax; c, head of male; d, last abdominal segments of male.

angle between the straight side and the parabolic front, and three long ones at the suture. Sides of head behind the clypeal suture straight, diverging to the antennae and bordered by the prominent antennal bands; these bands turn inward at the clypeal suture, fol-

lowing it and almost meeting at the center; three hairs, evenly spaced, on the margin between the clypeal suture and the short trabeculae and another one arising on the ventral surface extending beyond the margin at a point between the anterior two of those mentioned above. From a point near the posterior ends of the antennal bands arise two internal bands which extend obliquely inward a short distance, then curve forward and run parallel to the posterior lateral angles of the clypeal signature. A narrow dark band extends entirely around the posterior part of the head connecting the ocular bands; temples almost straight and slightly converging behind the eyes, rounded at the posterior angles; occipital margin concave; occipital bands narrow, distinct. Eye prominent with a short hair on the dorsal surface and a short spine at its posterior margin; six short hairs and spines on the temples. Antennae pale, second segment as long as the last two, third segment shortest. In the male antenna the first segment is large and about as long as the following three segments together; the second segment comes next in length and the fourth is the shortest; the third has a narrow pointed appendage; there is a horseshoe-shaped blotch at the base of the first segment.

Thorax trapezoidal; prothorax quadrilateral, with sides slightly diverging behind; coxae show through plainly; length, 16 mm.; width, 28 mm. Metathorax length, .36 mm.; width at posterior angles, .4 mm.; sides diverging behind; posterior angles rounded; lateral margins notched at a point about one-third the distance from the anterior angles with a dark blotch, probably marking the suture between the metathorax and mesothorax. There are six hairs arising from the dorsal surface in the posterior angles; the outer one is very long and arises from a large curious papilla; the second is short, arising from a small papilla; the other four are very long and close together in a group. (See b, Fig. 2.)

The abdomen is long and rather narrow, expanding slightly to the fourth segment which is widest; last segment bilobed, straight across the posterior margin in the male. There are narrow dark lateral bands on each segment except the last and transverse blotches, which extend about a third the way across the body, and there are also faint lengthwise median blotches. Each lateral band extends into the segment in front and has two long appendages which curve back making a clear space in the anterior margin of the transverse blotch of the segment to which the lateral band belongs. The blotch on the last segment is median and bilobed; the margin of this segment is transparent. There are about six hairs on each segment except the last, and several hairs in the posterior angles. In the male the posterior margin of the last segment is straight. The genitalia of the male are as shown in Fig. 2, d.

Goniodes aliceps Tasch.

Four specimens from "Colloma" (San Ernesto, Bolivia), "Colloma" being merely the local name, we are able to make from it no determination of the bird, but from the kinds of its parasites we can say, almost with certainty, that it is some species of Tinamou, probably *Crypturus* sp.

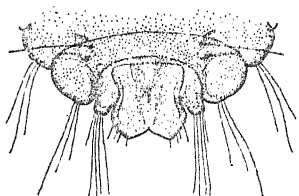
Goniodes agonus Nitzsch.

FIG. 3.—Last abdominal segments of *Goniodes agonus* Nitzsch. ♂

Six specimens, including one male, from "Colloma" (San Ernesto, Bolivia) collected with *G. aliceps*. The male of the curious species has not heretofore been recorded. Our male specimen unfortunately has the head damaged and the antennae lost. We figure (fig. 3) the last segments of the abdomen which differ greatly from the female.

3) the last segments of the abdomen which differ greatly from the female.

Colpocephalum osborni Kellogg.

Several specimens from "red-headed bustard" (Choro, Bolivia, 3700 metres, dry season).

Colpocephalum flavescens Nitzsch.

Two females from "hawk" (Charuplaya, Bolivia, 1350 metres, dry season):

Menopon maestum Kellogg and Chapman.

Three specimens from "bird" (Choro, Bolivia).

Menopon sp. (juv.).

One specimen from "blue finch" (Choro, Bolivia).

Trinoton luridum Nitzsch.

One specimen from "river duck" (Charuplaya, Bolivia).

Trinoton lituratum Nitzsch.

Two specimens from "river duck" (Charuplaya, Bolivia).

***Laemobothrium* sp.**

Two specimens from "grasshopper hawk" (Charuplaya, Bolivia). Although this species differs obviously from any *Laemobothrium* yet described in satisfactory manner, we shall not add a new species to this genus until the existing species determinations have been thoroughly revised. The genus is at present in a simply impossible condition.

***Physostomum doratophorum* Carriker.**

Several specimens from three (three species?) "humming-birds." (Choro. Bolivia.)

A New Genus of Nomadine Bees.

By S. A. ROHWER, Washington, D. C.

Some time ago Professor T. D. A. Cockerell requested information as to the generic position of *Pasites pilipes* Cresson. Late in October, Mr. J. C. Crawford, Jr., examined Cresson's type, which is in Philadelphia, making sure that the specimens in the U. S. National Museum were the same species as the type. On examination it was found that this species represents a new generic, or subgeneric, group in the family Nomadidae, differing from *Pasites* and the other genera in a number of points. The accompanying figures were made from camera lucida sketches:

***Nomadosoma* new genus.**

Type of the genus: *Pasites pilipes* Cresson (Cuba).

Rather small bees of Nomadine habitus; smooth and shining; mandibles simple; maxillary palpi as in figure 1; labial palpi four-jointed, the two basal joints as in figure 2, the two apical joints were accidentally broken; third antennal joint but little shorter than joints four and five; frontal carina almost wanting; scutellum flat, level with the mesonotum, somewhat depressed in the posterior middle; anterior coxæ with short tubercles, which are more distinct in the male, legs of the female more hairy than in male, and more hairy than in most

Holarctic species of *Nomada*; gaster as in *Nomada*, except that it is more flattened in female, with the venter more than normally pubescent, tergal segments shining very sparsely punctured; last apical segment of the male entire; fore wing as in figure 3, hind wings normal for *Nomada*.

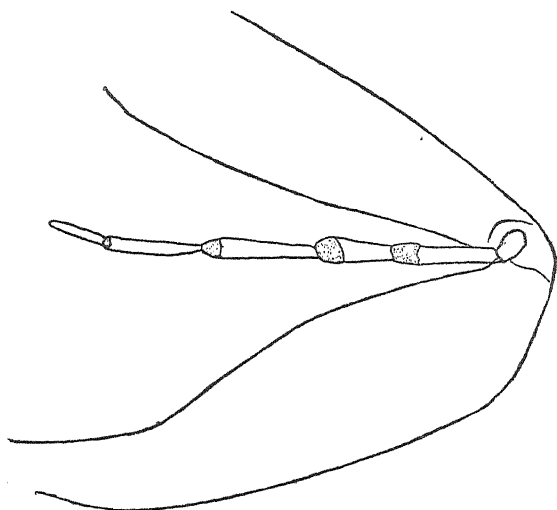


FIG. 1.—Maxillary palpi of *Nomadosoma pilipes* (Cresson), with the articulating maxilla.

The shining appearance, flat scutellum and two cubital cells distinguish this at once from its allies. In Robertson's tables (Can. Ent. Vol. 35, 1903, p. 173, etc.) *Nomadosoma* runs in with *Phor* Robertson and *Holonomada* Robertson. The male

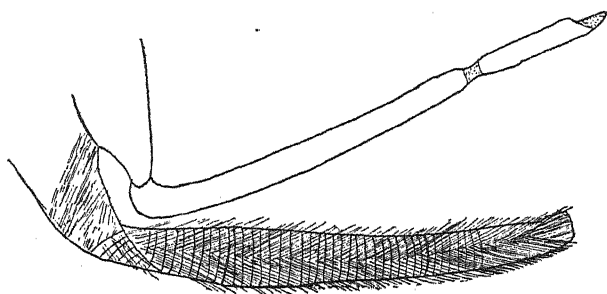


FIG. 2.—Two basal joints of labial palpi and tongue of *Nomadosoma pilipes* (Cresson).

runs to *Holonomada* Robertson. If the coxæ were said to be spined both sexes would run to *Ciphen* Robertson.

In Ashmead's tables (Tr. Am. Ent. Soc., Vol. 27, 1899, p. 49, etc.) it will not run satisfactorily.

In Cockerell and Atkin's table based on the trophi (Ann. Mag. Nat. Hist. Ser. 7, Vol. 10, July, 1902, p. 42, etc.) *Nomadosoma* runs to *Nomada fucata* Panzer.

Pasites Jurine, *Biastes* Panzer and *Nomadita* Mocsary belong to the Nomadiniæ and have two cubital cells. *Pasites* and *Biastes* have the gaster of the female of the cylindrical Nomadine type, the third antennal joint is much shorter than four plus five, the frontal carina is strong, the body is strongly punctured; *Pasites* has the radial cell truncate and the scutellum bilobate; *Biastes* has the scutellum rounded. *Nomadita* Mocsary, which is known from the male only, may have the venation as in *Heminomada* Cockerell, but as it is compared with *Biastes* perhaps has the venation as in that genus. It has, however, a strong frontal carina and the "scutellum bituberculatum."

Heminomada Cockerell has the first transverse cubitus (not the second) wanting, and differs in many other ways from *Nomadosoma*.

Nomadosoma pilipes (Cresson).

Cresson (Proc. Ent. Soc. Phila., Vol. 4, 1865, p. 183) described his *Pasites pilipes* as follows:

"Chestnut-brown, polished; sides of face, clypeus, collar, tubercles, two spots on pleura, postscutellum and narrow bands on abdomen, white; hind legs of ♀ densely pilose; wings hyaline, costa-apical margin fuscous.

"*Female*.—Chestnut-brown polished, clothed with pale pubescence; face flat, highly polished, impunctate; sides of the face obscurely, and the clypeus, whitish; cheeks and labrum densely pubescent; antennæ piceous, paler at base. Thorax indistinctly punctured, pleura and metathorax rather densely clothed with silvery-white pubescence; a line on the collar, tubercles, two spots on pleura, two small spots on scutellum, and the post-scutellum, white; scutellum slightly subbilobate; tegulæ brown, the outer margins pale. Wings hyaline, faintly tinged with fuscous, slightly iridescent, the costa-apical margin broad-

ly fuscous. Legs chestnut-brown, clothed with pale pubescence, which is long and dense on the posterior tibiae and tarsi; posterior coxae dilated and flattened, with a whitish spot at tip. Abdomen broadly ovate, convex, polished, rather densely clothed with short pale pubescence on the sides and apex; on the middle of the first, second, fourth and fifth segments above, a narrow, rather uneven, whitish fascia, that on the fourth segment interrupted on the middle; on each extreme side of the third segment a short, narrow, whitish line; apical segment truncate, densely clothed with fuscous pubescence; beneath chestnut-brown, immaculate. Length $3\frac{1}{2}$ lines; expanse of wings $6\frac{1}{2}$ lines.

"*Male*.—Resembles the female, except the abdomen is longer, not so broad, and pointed at tip as in males of *Nomada*; the posterior legs are not densely pilose as in the ♀. Length 3 lines; expanse of wings $5\frac{1}{2}$ lines.

"*Collection*.—Ent. Soc. Phila. Two specimens.

"This species has much the general appearance of a *Nomada*, and in the ♂ specimen, the only difference I can see is, that the anterior wings have only two submarginal cells, instead of

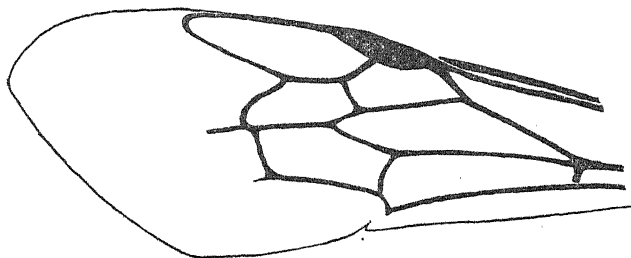


FIG. 3.—Anterior wing of *Nomadosoma pilipes* (Cresson).

three; but in the ♀, the form is more robust, and the hind legs are densely pilose, which is never the case in the females of *Nomada*."

The chestnut color in the specimens in the U. S. National Museum is replaced almost entirely by black. The female came from Cuba, the male was collected by Mr. A. Busck at Baracoa, Cuba, Aug., 1902.

PROFESSOR W. M. WHEELER, of the Department of Economic Entomology, Bussey Institution, Harvard University, started on his vacation November 1 and spent some days in the Huachuca Mountains, Arizona.

The Musical Habits of Some New England Orthoptera in September.

By H. A. ALLARD, United States Department of Agriculture, Washington, D. C.

Primarily to become better acquainted with the call notes of some New England katydids and grasshoppers, the writer spent the first three weeks of September, 1910, at Oxford, Mass. Throughout this period the days and evenings were pleasantly occupied in rambles through the fields and pastures in the beautiful Fort Hill region.* The stridulations of a number of musical Orthoptera were carefully studied. Observations concerning these may be of some aid to those who have become interested in the habits of musical insects.

The following species, including a few unmusical ones, were observed or captured:

In the fields and meadows: *Orchelimum vulgare* Harris; *Conocephalus ensiger* Harris; *Amblycorypha rotundifolia* Scudd.; *Scudderia texensis* S. & P.; *Scudderia furcata* Brunner; *Xiphidium fasciatum* DeG.; *Xiphidium brevipenne* Scudd.; *Gryllus pennsylvanicus* Burm.; *Nemobius fasciatus (vittatus)* Harris; *Stenobothrus curtipennis* Harris; *Melanoplus femoralis* Burm.; *Encoptolophus sordidus* Burm. In weeds, vines and shrubbery: *Oecanthus niveus* DeG.; *Oecanthus angustipennis* Fitch; *Oecanthus nigricornis* Walker; *Oecanthus quadripunctatus* Beut. Beneath leaves in damp localities: *Nemobius palustris* Blatchley. In wells, beneath stone piles, etc.: *Ceuthophilus maculatus* Harris. In lofty trees: *Cyrtophyllus perspicillatus* Linn.†

* About Sept. 22 the writer spent several days at Crestwood, Yonkers, N. Y. During warm, sunny afternoons many males of *Conocephalus triops*, Linn., were stridulating in the fields and meadows. In a small area hardly larger than 25 square feet, and overgrown with grass, weeds and asters the writer captured half a dozen specimens. The note is a keen continuous z-z-z-z-z-z-z-z. This *Conocephalus* is probably common throughout western and southern Connecticut as the writer heard the same stridulation in this region on his way into New York from Providence.

† The writer is indebted to Mr. A. N. Caudell, of the U. S. National Museum, who has kindly confirmed or made all identifications of Orthoptera listed in this paper.

The writer arrived at Mr. Howard's farm on Fort Hill in the afternoon of August 29, 1910. At this time the nights had become very cool, damp and autumn-like. Light frosts were expected in low grounds in some localities. As far as the eye could see across the hills, the fields were a fresh, alluring emerald green. Hosts of stridulating creatures were active by day and by night, producing a chorus of soothing sounds and harmonies.

In the clover fields and in the weeds by the roadsides were small colonies of *Orchelimum vulgare* Harris. The notes of this locust are rather soft, and are delivered in a leisurely manner, tsip-tsip-tsip-tseeeeeeeeeeeeeee. This locust is a late summer species and stridulates persistently by night as well as by day. At night, especially if the weather is chilly, its notes are not as brisk and as persistent as the day notes. Scudder says of its notes: "The night song differs from that of the day simply in its slower movement; the pitch of both is at B flat, two octaves above middle C."

Late in the evening and well into the night *Conocephalus ensiger* Harris, adds to the noisy chorus of insect sounds. This locust prefers the fresh herbage of cultivated fields, and is especially to be looked for in the fields of corn. One oftentimes finds a noisy singer perched 6 or 7 feet from the ground on a corn stalk or tassel.

The call notes of this *Conocephalus* are intermittent and follow each other rather briskly, tsip-tsip-tsip-tsip. These stridulations are continued indefinitely, and, to the writer's ears, lack any decided harshness or buzzing characteristic of *C. bruneri* and others. They are rather soft and lisping, recalling to mind the staccato lisps of an *Orchelimum*. *C. ensiger* is the only species with which the writer has become acquainted in this region. It is a very common species in nearly all upland localities. One sometimes meets with it in large colonies among the luxuriant weeds and grasses in lowlands.

McNeill says of this *Conocephalus*: "Its song is a loud rasping zip-zip-zip repeated indefinitely." He also states that

it recalls the staccato lisps of *Orchelimum vulgare*. The last comparison is more accurate, since the notes of this *Conocephalus* do not impress me as at all rasping.

A very common katydid at this season is the pretty *Amblycorypha rotundifolia* Scudd. Its notes may be heard at all times during the day as well as during warm nights. This *Amblycorypha* occurs everywhere in the grass, weeds and shrubbery of fields and pastures. It was especially abundant among the shrubby pasture growths, consisting mainly of species of *Vaccinium*, *Gaylussacia*, *Kalmia angustifolia*, and the two species of *Spiraea*, i. e., *tomentosa* and *salicifolia*. Its notes are soft and lisping and continue indefinitely. They may be expressed thus: Tsip-i-tsip-i-tsip-i-tsip-i-tsip. These stridulations recall the dainty lisps of part of the song of *Amblycorypha uhleri*. The writer's observations of its stridulations are very similar to those of Scudder.

Scudderia texensis S. & P. prefers particularly the open grass and clover fields. At Oxford, Mass., the writer has studied two distinct methods of stridulation produced at will by this *Scudderia*. The usual note heard from Massachusetts to Georgia is a soft sh-sh-sh-sh-sh-sh occasionally repeated. This note is produced by a rapid shuffling of the wings very briefly. At other times and much more rarely the call consists of a succession of sharp, keen, distinctly rasping notes slowly delivered, zeet-zeet-zeet-zeet. These notes, which are so unlike the usual call, are usually answered at once in a similar manner by another individual elsewhere. One is at first tempted to assign them to some other insect.

By creeping carefully toward a musician, the writer has watched this mode of stridulation close at hand. The tegmina are very slowly and deliberately opened and rasped upon each other slowly several times. These notes are really more in keeping with the incisive notes of other *Scudderias*. It is evident that these notes are not accidental. They probably convey some definite meaning to other individuals within earshot.

Scudderia texensis becomes noisy as soon as the afternoon

sun gets low, and continues to stridulate into the evening. These locusts sometimes congregate in small colonies of half a dozen or more in favored spots. It is a persistent singer, although its notes are delivered at rather irregular and infrequent intervals, a characteristic of most *Scudderias*. I have as yet noted only the usual sh-sh-sh-sh at Thompson's Mills, Georgia, where it is very common.

Scudderia furcata Brunner, is possibly less common in central Massachusetts than the preceding species. At least it is much less frequently heard in stridulation. Its calls are delivered only at long and irregular intervals, and consist of a single, keen, incisive zeep, or sometimes three slowly in succession, zeep-zeep-zeep.

One warm, sunny afternoon in early September, 1910, in order to locate and capture one of these katydids which had just produced its single zeep, the writer lay down on the grass in the vicinity and waited. The insect did not repeat its note until nearly two hours later, after which the capture was easily made. This katydid stridulates during afternoons and less frequently at night. Its call is delivered only at long and irregular intervals, so that much patience must be exercised to locate a singer. Riley's description of the notes of *Scudderia furcata* is very exact: "It consists of a softer zeep, zeep, sometimes uttered singly but generally thrice in succession."

A few times the writer has heard in this locality as late as the last week of October the single incisive zeep of some belated katydid. The call usually issued from the green foliage of some shrub or apple tree which had delayed shedding the leaves. It is possible that this was the call of *Scudderia furcata*. *Scudderia texensis* had long since become silenced by the cold days and nights of this season.

The tiny *Xiphidium fasciatum* DeG. prefers the tangles of weeds and grasses bordering the grass fields, and may often-times be found in large colonies. Its notes are extremely faint, and in manner of delivery are the exact counterpart of an *Orchelimum*'s notes. The staccato lisps nearly always precede

the phrase tseeeeeeeeeeeeeee. The entire song may be written thus: Tip-tip-tip-tseeeeeeeeeeeeeee. The entire stridulation is so faint as to escape the hearing. The staccato lisps, tip-tip-tip, were so faint the writer could hear them only by the closest attention, although the wings could be seen in motion at the time.

At this season of the year, with the usual New England breezes stirring the herbage violently, and accompanied by the incessant chirpings of *Gryllus pennsylvanicus* and *Nemobius fasciatus vittatus*, the attenuated lisplings of *Xiphidium fasciatum* became quite inaudible. It seems as if the notes of the New England individuals are considerably fainter than those the writer has studied in Northern Georgia. Representing graphically the preceding staccato lisps by dots and the prolonged phrases tseeeeeeeeeeeeeee by dashes, the successive notes of an individual which the writer observed in a box were thus: ... — ... — —

.... — — — ..

It is evident that from three to six staccato lisps preceded each time the phrase tseeeeeeeeeeeeeee. This method of representing the notes at once shows the relative frequency of the staccato lisps and the longer phrases, as these vary greatly with different species, both *Xiphidiums* and *Orchelimums*.

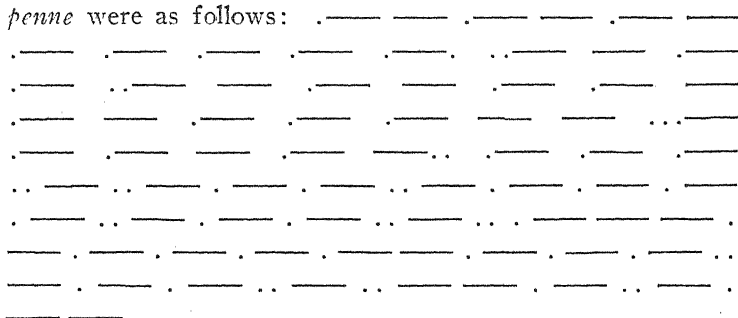
McNeil says of *Xiphidium fasciatum*: "Its song is a faint echo of that of *Orchelimum vulgare*, with the zip-zip omitted." He speaks also of its "faint little quaver." It is evident that McNeil had failed to catch the staccato lisps which are always present in the call notes of this tiny locust.

Another tiny *Xiphidium* occurring in all situations in company with *Xiphidium fasciatum* is *Xiphidium brevipenne* Scudd. It is possibly less common in this locality than *fasciatum*. The writer could not determine its stridulations in the field, so a number of males and females were placed in a pasteboard box together with some grass. In a few minutes a number were in continuous song throughout the afternoon and night. The stridulations of this *Xiphidium* are the least audi-

ble of any locust the writer has ever observed. Although a persistent singer, the notes become inaudible only a few feet away. In the fields they are quite lost amidst the sounds of rustling foliage, the chirpings of crickets, etc.

The notes of *Xiphidium brevipenne* are very brief and much more hurried in their delivery than those of *X. fasciatum*. In this respect they approach more nearly the dainty stridulations of *X. nemorale* Scudd. In the song of *X. brevipenne* usually only one or two almost inaudible staccato lisps precede one, two or even three of the brief, faint phrases, tseeeeeee-tseeeeeee. The phrases tseeeeeee are of much longer duration in the song of *X. fasciatum*, and are rarely heard without the preceding staccato lisps which are of indefinite number.

Graphically represented, the notes of an individual *X. brevipennis* were as follows: . ——— ——— . ——— ——— . ——— ———



Gryllus pennsylvanicus Burm., at this season may be found in great numbers crawling over the grassy upland fields chirping incessantly in the sunshine. Its notes in New England are always a brief intermittent musical chirp-chirp-chirp.

Nemobius fasciatus (vittatus) DeG. occupies the grassy fields and pastures everywhere, trilling incessantly during the hours of sunshine. In some localities the trill is very brief and shrill tiiii-tiiii-tiiii. In others the trill is exceedingly high and indefinitely prolonged ti-ti-ti-ti-ti-ti-ti-ti. The prolonged trillers appear to be confined almost entirely to dry, grassy, upland situations. The intermittent singers seem to prefer low, wet grounds. This distribution is rather clearly defined.

Piers who has carefully studied some of the Nova Scotia Orthoptera, found this *Nemobius* exceedingly abundant in the fields around Halifax.* His excellent description of its intermittent notes is as follows: "Its notes are one of the most familiar sounds of autumn and are heard both during the day and night. The stridulation is produced by lifting the wing covers about 45 degrees above the abdomen and then shuffling them together producing a sound resembling the word plee-e-e-e plee-e-e-e plee-e-e-e or cree-e-e-e. It has been suggested that these notes can be reproduced by taking a silver half dollar between the fingers and striking the coin with the edge of a nickel."

A very common little grasshopper in nearly all warm, sunny, grassy situations is *Stenobothrus curtispennis* Harris. The writer found this insect particularly common in dry upland fields with a sunny southern exposure. Small colonies were always evident by their brief faint silken lisps several times repeated at irregular intervals. This little Acridian is heard only during the day. Its stridulations are produced by sawing the inner surface of both thighs simultaneously against the edges of the tegmina. Blatchley finds it more abundant in Indiana in damp grounds near tamarack swamps.

Melanoplus femoratus Burm., and *Encoptolophus sordidus* Burm., are two common field insects in late summer and early autumn. The former is clumsy and apparently unmusical. The latter is a vigorous flyer and produces a lively crepitation during its flight movements over the fields.

Four fragile-bodied musical tree crickets occupy almost exclusively the shrubbery and vines. These are all species of *Oecanthus*, namely, *O. niveus*, *O. angustispennis*, *O. nigricornis* and *O. quadripunctatus*.

Oecanthus niveus DeG. is usually called the fall cricket. This beautiful pearly-winged creature takes up its abode in our grape arbors, hedges, etc. Its notes are low, deep-toned,

*. "Preliminary Notes on the Orthoptera of Nova Scotia," by Harry Piers, in Proceedings and Transactions of the Nova Scotia Institute of Science, Vol. IX, 1895-96.

and solemn in their effect upon the mind. Single singers sometimes continue to stridulate by day, but the great synchronal chorus begins at evening. If the night is warm and moonlight, waves of solemn, rhythmical music soon swing backward and forward between the hedges. It is worth while to hear this grand, antiphonal serenade, for it induces a peculiar, indescribable psychic state—an intermingling of sadness and reposeful meditation. It is a "slumbrous breathing" to the mind of Thoreau. Hawthorne calls it an "audible stillness" which "if moonlight could be heard, it would sound like that." Lafcadio Hearn in Japan may as well have heard these same solemn cricket sounds when he wrote: "The pleasure-pain of autumn's beauty, the weird sweetness of the voices of the night, the magical quickening of remembrance by echoes of forest and field." This tree cricket sings until the nights become so cold that the intermittent c-r-e-a-k—c-r-e-a-k is very slowly delivered. The notes of this cricket have been more carefully described than the notes of most other species, by Davis, McNeil, Fitch, Burroughs, Thoreau, Hawthorne and others.

Scudder's description of the song of *Oecanthus niveus* does not well apply to the intermittent notes of this cricket. He says: "The song of the male is an exceedingly shrill and rapid continuous trill; its 'dry rosined wings' must play upon each other with wonderful rapidity, for at its slowest, and the rapidity varies somewhat, there are at least sixteen beats a second; the trill is nearly uniform and lasts for from two or three seconds to a minute or two."* The shrill pitch and the prolonged trill make it very probable that Scudder had heard the trill of *O. nigricornis* or *O. quadripunctatus*. McNeil aptly remarks that Scudder's description and musical notation of *niveus* "seems to be the song of *fasciatus*."

Oecanthus angustipennis Fitch, is considerably less common than the other species of *Oecanthus* at Oxford, Mass. It prefers the abundant foliage of the sweet fern, and is very

*. "Some American Crickets," by S. H. Scudder, in Harper's Magazine, Vol. XCIII, October 1896.

musical on cloudy days and at night. It may sometimes be heard in low trees. This tree cricket appears to be more susceptible to cold than the others, and sooner becomes silent at the approach of autumn. Its notes are a faint, intermittent phrase—treeeeeeee—with nearly equal intervals of silence intervening. Davis accurately describes it as "a faint, continuous whir, lasting only about five seconds, with an equal interval of rest." Blatchley's description is very similar. W. Faxon* describes them as "consisting of a trill of several seconds' duration succeeded by a short pause; this song suggests the spring note of the toad heard afar off."

Oecanthus nigricornis Walker is not as arboreal in its habits as the preceding species. It dwells among weeds, grass and golden rods nearly everywhere in fields and pastures. Its song is a steady, quavering, sustained trill. The trill of some individuals is strong, deep and rich-toned, recalling the mellow trill of *O. latipennis*. The pitch and volume of sound vary noticeably with different individuals of this species. This *Oecanthus* is a common species at Oxford, Mass., in August and September.

Oecanthus quadripunctatus Beut. is also a common species, preferring the same environment of weeds and low shrubs as *O. nigricornis*. The writer has been unable to find any constant differences which serve to distinguish the trills of these two species. That of *O. quadripunctatus* is long sustained and sometimes shrill. The notes of other individuals are stronger and deeper-toned, recalling the melodious trill of *O. latipennis* as do those of *O. nigricornis*. The stridulations of *O. quadripunctatus* in New England have always seemed louder and lower-toned to the writer than the weaker and shriller trilling of the same species in Northern Georgia. This *Oecanthus* is a persistent triller throughout the days and nights. Faxon says: "Song similar to No. 3 (meaning *O. nigricornis*) but clearer in tone and no doubt sufficiently distinct on close ac-

*. "Habits and Notes of the New England Species of *Oecanthus*," by Walter Faxon, in *Psyche*, Vol. 9, No. 300, April 1901.

quaintance." The writer has not yet been able to distinguish them this readily.

Beneath the matted leaves and grass in damp spots and gullies by the roadsides, and in low, wet grounds the little *Nemobius palustris* Blatchley, dwells. In such situations small colonies of four or five individuals may be heard in stridulation. The stridulation of this pretty *Nemobius* is a faint, quavering, high pitched trill almost indistinguishable from the trill of the more southern *Nemobius janus* Kirby. The notes of these two species are so closely alike that the writer thought he had heard *N. palustris* around Washington, D. C. It proved to be the trill of *N. janus*, however. Its weak trill and the habit of keeping well concealed beneath stones and leaves, together with its local and irregular distribution in any locality have no doubt caused this little cricket to be many times overlooked. In comparison with *N. fasciatus vittatus*, it is not an especially common species at Oxford, Mass. A naturalist, however, familiar with its habits and stridulation could capture a fair supply of specimens in this region. It is a very shy cricket and can rarely be seen in stridulation.

The writer has taken *Ceuthophilus maculatus* Harris, several times at Oxford, Mass. Once or twice it was found deep down in the crevices of a stone pile, and at other times in crannies in covered wells. It is an unmusical insect.

At Oxford, Mass., the big katydid, *Cyrtophyllus perspicillatus* L., is not especially common judging from the numbers heard in song at different localities. In some localities it is entirely absent, especially in the West Oxford district. Each year one or two small colonies may be heard in some big maples on Mr. Howard's farm near Fort Hill. It is an exceedingly common and noisy insect in some big woods near Quinnebaug, Connecticut.

This katydid stridulates almost entirely after dark, although its notes are sometimes heard during the day. There are few insect stridulations as loud, rasping and grating as those of *Cyrtophyllus perspicillatus*. It is not by any means an easy

matter to locate and capture one of these insects on the topmost branches of a maple. The writer heard a few of these katydids on Fort Hill as late as September 20, 1910.

At this season when the nights were coolest the notes of this katydid were so slowly and difficultly delivered that they had become almost painfully rasping and grating in character. One dark, windy night the writer spent an hour or more trying to locate a male in the top of a lofty maple. By the aid of lighted matches the position of the insect was located. The insect was so benumbed with cold that it could barely rasp its tegmina upon each other.

Scudder says that its stridulation "has a shocking lack of melody * * * so that the air is filled by these noisy troubadours with an indescribably confused and grating clatter."

In many respects autumn is a particularly favorable season for the study of musical insects. Insects are very susceptible to changes of temperature. Many musical insects, which in midsummer stridulate almost entirely after dark, gradually cease their nocturnal stridulations as the autumn nights become colder. Day by day, as the season advances, and the chill of evening becomes more noticeable, the musical katydids and crickets usher in their chorus a little earlier each afternoon, until practically all the nocturnal singers are in full chorus shortly after midday. At Oxford, Mass., the writer entered the following notes in his journal concerning lower temperatures and insect stridulations.

September 15, 1910, "following recent rains the nights have become very cold. They would be almost silent but for the slow, painful raspings of a few individuals of *Cyrtophyllus perspicillatus* and the synchronal music of *Oecanthus niveus*. *Amblycorypha rotundifolia* becomes quite silent, or at least barely audible if the nights are not too cold. *Conocephalus ensiger* is less sensitive to the cold and continues to stridulate persistently, even after *Amblycorypha rotundifolia* has been silenced by the evening chill.

Insects which I heard almost entirely after dark a few weeks

ago I now hear from midday until sunset, when most species again become practically silent. If the afternoon is warm and sunny, however, the fields and pastures are filled with various insect sounds. By the roadsides, in the fields among golden rods and asters, the happy musicians disport themselves. *Amblycorypha rotundifolia*, *Conocephalus ensiger*, *Orchelimum vulgare*, *Scudderia texensis*, *Scudderia furcata*, all are as noisy as they can make themselves. It is a simple matter now to observe and capture almost any musician, for all seem less inclined to fly after experiencing the cold nights of this season.

If the weather moderates suddenly and the evenings become warm with threatening thunderstorms, the usual nocturnal awakening follows. *Oecanthus niveus* suddenly starts the warm night air into an almost audible pulsation; the big *Cyrtophyllus perspicillatus* rasps out a faster tune; *Conocephalus ensiger*, *Amblycorypha rotundifolia* and *Scudderia furcata* lisp their loudest each in his own manner, until it seems as if the silent shrubs of a few nights ago had transformed their leaves into living, lisping creatures."

Although the stridulations of insects become noticeably slower and fainter in cold weather, the pitch and manner of delivery characteristic of each species does not materially change.

MR. J. CHESTER BRADLEY, Special Assistant Entomologist of the Georgia State Board of Entomology, Atlanta, Georgia, has undertaken the preparation of a preliminary catalog of insects of that State, and will appreciate greatly any co-operation on the part of those possessing records of Georgia specimens.

DR. F. D. GODMAN has acknowledged the receipt, in London, of the first and principal set of his own Mexican and Central American Odonata, described and enumerated in the *Biologia Centrali Americana*, from Dr. P. P. Calvert. The specimens will be placed in the British Museum of Natural History.

MR. R. J. TILYARD's recently published "Monograph of the genus *Synthemis*" (Proc. Linn. Soc. New South Wales, 1910, Vol. XXXV, pp. 312-377, 6 plates, 2 of them colored) contains some observations on Corduline dragonflies and their affinities, of interest to students of this group in all parts of the world.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, four weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—Ed.

PHILADELPHIA, PA., JANUARY, 1911.

In another place in this number attention has been called to editorial changes in the NEWS staff and the hope has been expressed that the friends and supporters of this journal in the past will continue their aid as contributors to its pages and as subscribers to its resources. We ask not only for the systematic, life-history, anatomic and physiologic papers on insects, arachnids and myriopods, but also for the proceedings of entomological clubs and societies and all notes, brief or longer, which, to quote the original prospectus of the NEWS, dated December 1, 1889, "will keep entomologists *en rapport* with what is being accomplished in serials and by monographs at home and abroad, and which will also give the items of interesting news concerning explorations and explorers, collections and collectors."

PLEASE NOTICE that after January 10, 1911, the NEWS will be mailed only to those who have renewed their subscriptions.

SINCE the NEWS is not strictly adverse to the publication of non-scientific entomological articles, I have to record a brief contribution which may not be without interest. Most entomologists are, I presume, without sympathy for the average novel, but two recent books from the pen of Gene Stratton-Porter, "Freckles" and "A Girl of the Limberlost," may not only offer some entertainment to Lepidopterists, but the beginner may possibly gain some knowledge from them. Such statements as are made in the latter work, however, that *Citheronia regalis* is the rarest moth in America and "worth a dollar apiece" are unfortunate, as they may prove misleading to any who might be influenced by these two books to enter the study of entomology.—KARL R. COOLIDGE.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

THE Department of Zoology and Entomology of the Ohio State University, lately issued an invitation to its friends to call and inspect the collection of Butterflies and Moths recently donated by Mrs. Catherine Tallant, of Richmond, Indiana, to the Department; a special exhibition of this collection was given on December 8th, 9th and 10th, 1910, in Biological Hall, of the University.

THE UNIVERSITY OF SASKATCHEWAN promises to be a magnificent foundation when entirely completed. It contains two colleges—the College of Arts and Science and the College of Agriculture. Prof. T. N. Willing, the well known entomologist, is Professor of Natural History and Secretary of the College of Agriculture. The college is indebted to Prof. Willing for the use of his well-chosen museum, consisting of plants, insects, birds, fur bearing and other animals peculiar to Saskatchewan. The University is located in the flourishing town of Saskatoon.

PROTAMBULYX CARTERI.—In Dr. William Barnes' List of North American Sphingidae, recently published in *Psyche* (Vol. XVII, No. 5), he refers to *Protambulyx carteri* R. & J. He writes: "Rothschild and Jordan give Florida as a locality for this new species on the strength of a single ♂ received from the Kny-Scheerer Company."

I, myself, captured this specimen and sent it to Baron Rothschild, Dr. Lagai of the Kny-Scheerer Company kindly including it in a lot of Lepidoptera he was sending at the time. After some delay and an offer from the Baron to purchase the specimen it was returned to me. It is now in my collection, having a label in the handwriting of its describer. I have several others of the same species, taken by myself at light in Miami, Florida.—ANNIE TRUMBULL SLOSSON.

THE undersigned has been working upon the subject of "Insects Injurious to Books" for a number of years, and would be thankful for any information of this character that the readers may be able to give him.—WM. R. REINICK, The Free Library of Philadelphia, 17th and Spring Garden Streets, Philadelphia, Pa.

WE HAVE lately received an interesting letter from Prof. C. B. Hardenberg, M.A., Government Entomologist, Transvaal Department of Agriculture, Pretoria, Africa. He has fourteen men in the Entomological Department, seven being employed as fruit and plant inspectors. The entomologist is inaugurating a system of note-keeping

and recording like that used in the Bureau at Washington. Up to date methods for the care of specimens are also being introduced and new collections are being made as rapidly as possible. "Collecting goes on here all the year, especially in the northern parts of the country and the 'low veld' and I am papering a lot of duplicates for future use. This country is a paradise for Orthoptera, especially Locustidae and Mantidae, the latter often attaining the most absurd shapes and configurations. They are most abundantly found in the wild Acacias, or thorn bushes which dot the veld.


"Taking everything into consideration it is a very interesting country entomologically. Very little life-history work or scientific investigation has been done, in fact only the surface has been skimmed here and there, and there is an exceedingly large field for an enthusiastic worker."

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), excluding Arachnida and Myriapoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted. This (*) following a record, denotes that the paper in question contains description of a new North American form.

For record of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

 All publications noted in the following list are dated 1910 unless otherwise noted.

- 2—Transactions, American Entomological Society, Philadelphia.
 3—The American Naturalist. 4—The Canadian Entomologist. 7—U. S. Department of Agriculture, Bureau of Entomology. 9—The Entomologist, London. 11—Annals and Magazine of Natural History, London. 14—Proceedings, Zoological Society of London. 35—Annales, Societe Entomologique de Belgique. 38—Wiener Entomologische Zeitung. 40—Societas Entomologica, Zurich. 47—The Zoologist, London. 55—Le Naturaliste, Paris. 86—Annales, Societe Entomologique de France, Paris. 89—Zoologische Jahrbucher, Jena. 92—Zeitschrift fur wissenschaftliche Insektenbiologie, Berlin. 97—Zeitschrift fur wissenschaftliche Zoologie, Leipzig. 123—Bulletin, Wisconsin Natural History Society, Milwaukee. 128—Proceedings, Linnean Society of New South Wales, Sidney. 141

—Proceedings, Indiana Academy of Sciences, Indianapolis. 142—Report, Michigan Academy of Sciences, Lansing. 181—Guide to Nature, Sound Beach, Conn. 186—Journal of Economic Biology, London. 198—Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass. 218—Mikrokosmos. Zeitschrift für die praktische Betätigung aller Naturfreunde, Stuttgart. 239—Annales, Biologie Lacustre, Brussels. 297—Bulletin, Indiana Department of Geology and Natural Resources, Indianapolis. 298—Ofversigt, Finska Vetenskaps-Societetens Forhandlingar. A. Matematik och Naturvetenskaper, Helsingfors. 299—Mitteilungen der Naturhistorischen Gesellschaft zu Hanover. 300—Ontario Natural Science Bulletin, Guelph.

GENERAL SUBJECT. Blatchley, W. S.—The life zones of Indiana as illustrated by the distribution of Orthoptera and Coleoptera within the state, 141, 1908, 185-191. Brocher, F.—Les phénomènes capillaires. Leur importance dans la biologie aquatique, 239, iv, 89-138. Observations biologiques sur quelques Diptères et Hyménoptères dits "aquatiques," 239, iv, 170-186. Burrill, A. C.—Pine-cone willow gall abundant. Grape-vine gilbert gall, 123, vii, 130-131. Doane, R. W.—Insects and disease. A popular account of the way in which insects may spread or cause some of our common diseases, 227 pp. 1910. Henry Holt & Co. Girault, A. A.—Notes on variation in duration of similar periods of embryonic development; its bearing on the theory of effective temperatures, 123, viii, 10-20. Smith, J. B.—The insects of New Jersey (list). Annual report of the New Jersey State Museum for 1909. 880 pp.

APTERA & NEUROPTERA. Bugnion, E.—Observations relatives à l'industrie des termites, 86, lxxix, 129-144. Calvert, P. P.—Zoological researches in Costa Rica. Old Penn. Weekly review of the University of Pennsylvania, Vol. ix, pp. 165-170. Dampf, A.—*Mesopsylla eructa* n. g. n. sp., ein neuer Floh von der Springmaus nebst Beiträgen zur Kenntnis der gattung *Palaeopsylla*, 89, Suppl. 12, 609-664. Fahrenheit, H.—Neue Lause. (II Die Larven von *Pediculus capitis*, 299 D, 1st Jahrb., 57-75, 1910. Friedenthal, H.—Haarparasiten und Haarkrankheiten des Menschen, 218, viii, 156-163. Muttkowski, R. A.—New records of Wisconsin Dragonflies, 123, viii, 53-59. Tillyard, R. J.—Studies in the life-histories of Australian Odonata, 128, xxxiv, 697-708, 1909.

ORTHOPTERA. Schleip, W.—Der Farbenwechsel von *Dixippus morosus*, 89, xxx, 45-132. Walker, E. M.—The Orthoptera of Western Canada, 4, xlii, 333-340, 351-356 (*).

HEMIPTERA. Cockerell, T. D. A.—A new *Aleyrodes* on Am-

brosia, 4, xlii, 370-371 (*). **Herrick, G. W.**—*Tragionia celtis* n. sp. 4, xlii, 373-374. **Pierantoni, U.**—Ueber den Ursprung und die Struktur des eiförmigen Körpers von *Dactylopius citri* und des grünen Körpers von *Aphis brassicae*, 40, xxv, 61-62. **Poppius, B.**—Neue *Ceratocombiden*, 298, lii, No. 1, 1-14 (*).

LEPIDOPTERA. **Barnes & McDunnough.**—A new *Thecla* from Texas, 4, xlii, 365-366 (*). **Coolidge, K. R.**—Notes on the genus *Thecla*, 4, xlii, 374-375. **Cosens, A.**—Lepidopterous galls on species of *Solidago*, 4, xlii, 371-372. **Dampf, A.**—Zur Kenntnis gehäusetragender Lepidopterenlarven, 89, Suppl. 12, 512-608. **Forbes, W. T. M.**—Larva of *Ptochoryctis tsugensis*, 4, xlii, 364. **Frohawke, F. W.**—The number of larval stages of *Lycaena acis*, 9, xliii, 305-306. **Gibson, A.**—A list of butterflies taken at Toronto Ontario, 300, 1910, No. 6, 35-44. **Kutschera, G.**—Die Larchentriebmotte, 218, viii, 163-165. **Mitterberger, K.**—Zur Kenntnis der ersten Stände von *Cacoecia histriionama*, 92, vi, 353-354. **Pierce, F. N.**—Value of genitalia, 9, xliii, 304. **Prout, L. B.**—New Neotropical Geometridae (continued), 11, vi, 232-247, 316-333, 432-440, 508-526. **Reiff, W.**—Ueber das Zirpen der Raupen, 123, vii, 109-110. **Richter, V. K.**—Beschreibung der Eier von *Pieris rapae*, *Agrotis forcipula*, und *Mamestra reticulata*, 92, vi, 352-353. **Rowland-Brown, H.**—A note on the new classification of certain Hesperid butterflies, 9, xliii, 306-309. **Russell, H. M.**—The pecan cigar case-bearer (*Coleophora caryae-foliella*), 7, Bull. No. 64, pt. x. **Smith, J. B.**—New species of Noctuidae for 1910, No. 2, 2, xxxvi, 251-266. **Thierry-Mieg, P.**—Descriptions de lepidopteres nouveaux, 35, liv, 384-390. Descriptions de lepidopteres nouveaux, 55, xxxii, 235, 247-248. **Wolley Dod, F. H.**—A new *Autographa* from the Alberta rockies, 4, xlii, 349-350 (*).

DIPTERA. **Brues, C. T.**—Some further remarks on the systematic affinities of the Phoridae, with descriptions of new species, 123, vii, 102-108 (*). **Coquillett, D. W.**—Corrections to my paper on the type-species of the No. American genera of Diptera, 4, xlii, 375-378. **Graenicher, S.**—A preliminary list of the flies of Wisconsin belonging to the families Bombyliidae, Syrphidae and Conopidae, 123, viii, 32-44. **Reeves, C. D.**—A remedy for the Black-fly pest in certain streams of the southern peninsula of Michigan, 142, xii, 77-78. **Speiser, P.**—Beiträge zur Kenntnis der Dipteren-Gruppe Heleinae, 89, Suppl. 12, 735-754.

COLEOPTERA. **Blatchley, W. S.**—The Coleoptera or beetles of Indiana, 297, i, 1386 pp. (*). **Bowe, M.**—Beetles and how to collect them (popular account), 181, iii, 289-293. **Buhk, F.**—Stridulationsapparat bei *Spercheus emarginatus*, 92, vi, 342-346. **Gebien,**

H.—Coleopterorum catalogus. Pars 22: Tenebrionidae II, 167-354.
Holste, G.—Das Nervensystem von *Dytiscus marginalis*, Ein Beitrag zur Morphologie des Insektenkörpers, 97, xcvi, 419-476. **Kolbe, H.**—Ueber die Phileurinen Amerikas, 35, liv, 330-354 (*). **Lameere, A.**—Revision des Prionides (cont.), 35, liv, 368-383. **McDermott, F. A.**—A note on the light-emission of some American Lampyridae, 4, xlii, 357-363. **Moser, J.**—Beitrag zur kenntnis der Cetoniden, 35, liv, 355-367. **Netolitzky, F.**—Bemerkungen zur Systematik in der Gattung *Bembidion* Latr., 38, xxix, 209-228. **Wolcott, A. B.**—The Cleridae of the public museum of the city of Milwaukee, 123, vii, 93-102 (*). **Xamheu, C.**—Moeurs & metamorphoses des especes du genre *Rhizotrogus*, 55, xxxii, 233-235.

HYMENOPTERA. **Brues, C. T.**—Notes and descriptions of N. A. parasitic Hymenoptera VIII, 123, viii, 45-52 (*). A preliminary list of the Proctotrypoid Hymenoptera of Washington with descriptions of new species, 123, vii, 111-122 (*). **Butterfield, E. P.**—Bees killed by wasps (note), 47, xiv, 396. **Cockerell, T. D. A.**—Some insects from Steamboat Springs, Colorado, II., 4, xlii, 366-370 (*). **Ferton, C.**—Notes detachées sur l'instinct des hymenopteres melliferes, 86, lxxix, 145-178. **Lovell, J. H.**—The color sense of the honey-bee: can bees distinguish colors? 3, xliv, 673-692. **Managan, J.**—Some remarks on the parasites of the large larch sawfly *Nematus erichsonii*, 186, v, 92-94. **O'Brien, R. A.**—Remarks on the habits of the Green Tree-Ant of Australia (note), 14, 1910, 669-670. **Schrottky, C.**—Neue sudamerikanische Arten der Bienengattung *Anthidium*, 38, xxix, 267-271. **Turner, C. H.**—Experiments on color-vision of the honey bee, 198, xix, 257-279.

INSECTS AND DISEASE: A popular account of the way in which insects may spread or cause some of our common diseases, with many original illustrations from photographs, by R. W. Doane, A. B., Assistant Professor of Entomology Leland Stanford Junior University. Henry Holt and Company, New York, 1910. Price \$1.50, net; by mail \$1.62. The wonderful growth of the study of insect-carried disease has necessitated a book of this character. While the literature of the subject is very large it is scattered through many publications in this country and abroad and not very accessible to the lay student. This work epitomizes the subject in a clear manner and affords the interested reader a general knowledge of this important subject. The illustrations are numerous and well chosen and there is a selected bibliography appended. It is not so many years ago when the writer of this notice made the remark that house-flies carry typhoid fever, to one of the now prominent students of the subject, who said he did not believe such a

thing possible. The same thing happened in regard to malaria. The subject of the insect transmission of disease is not a new subject, but its great importance has only been realized in the last ten years. The time is rapidly approaching, when the necessity will arise for books on this important subject relating to one insect, for instance, the house-fly. We are glad to see the present work as we believe it will occupy a useful place. H. S.

THE COLEOPTERA OR BEETLES OF INDIANA. BY W. S. BLATCHLEY.—This work is characterized by the author as an illustrated descriptive catalogue of the beetles of his State, exclusive of the Rhynchophora. It represents an enormous amount of labor, which, however, seems fully justified by the results. Its chief importance lies in the fact that it is the only American work yet published which will serve to give, within a single volume, really efficient aid in identifying the Coleopterous fauna of a large district. It is a difficult matter to get a publisher for so extensive a treatise unless it deals with a subject much more popular than this one.

Mr. Blatchley has followed, in the main, the "Classification" of Le Conte and Horn, relying for specific keys chiefly upon the papers of monographers whose works are cited in the proper places. The result, therefore, is a very orthodox production in which the beginner will find little in conflict with views already published. Following the keys, more extended descriptions of each species are given, with notes upon rarity, modes of occurrence and dates. The whole forms a book of nearly 1400 pages illustrated by 590 figures. In it are treated 3312 species, 2512 of which are known to occur in Indiana and 79 are now described as new to science.

The typography is good, so are the figures which are largely original and will be a most welcome addition to the stock available for future writers. The book is just what has been needed by students of this order in the central States, and will certainly be much sought after by public and private libraries. It is handled by the Nature Publishing Co., of Indianapolis, although it was brought out by Mr. Blatchley as Bulletin I of the Indiana Department of Zoology and Natural Resources, in his capacity of State Geologist.—H. F. WICKHAM.

Doings of Societies.

ENTOMOLOGICAL SECTION, ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA.

Meeting of November 17, 1910. Mr. H. W. Wenzel, Vice-Director, presided. Ten persons were present.

Mr. Rehn made some remarks on the trip made by Mr.

Morgan Hebard and himself during the past summer in search of Orthoptera. Portions of Nebraska, Wyoming, Colorado, Idaho, Oregon, Washington, California, Nevada, Arizona, New Mexico and Texas were visited and extensive collections made. The object of the expedition was to extend the reconnaissance work done in previous years by the same individuals, paying particular attention to certain previously unstudied or poorly studied regions such as the Snake River desert, Idaho; eastern Oregon; Mt. Hood, Oregon; the Walker Lake region, Nevada; Ventura Mts., California; the Gila desert, Arizona, and the Baboquivari Mountains and surrounding valleys, Arizona. The returns exceeded the great expectations and hundreds of field notes were made, bearing on the distribution and plant relation of many species. A number of new species are known to be included in the collection. Numerous photographs illustrating the types of country visited were exhibited.

Mr. H. S. Harbeck was elected an Associate of the Section.

HENRY SKINNER, M.D., *Recorder.*

FELDMAN COLLECTING SOCIAL.

A regular meeting was held October 19th, 1910, at 1523 S. 13th Street, Philadelphia. Thirteen members were present; Messrs. Dickerson, of New Brunswick, N. J., and Viereck and Crawford, of Washington, D. C., visitors.

President Harbeck in the chair.

Dr. Skinner said he had noticed the scarcity of insects, even of the common species, on his recent trip to Europe. He described the various collections in the British Museum and gave an account of the meetings of the World's Entomological Congress in Brussels.

Mr. Dickerson said the *Catalpa sphinx* seems to be traveling in a northeasterly direction in New Jersey, he having seen specimens from Springfield. He described the parasites' attack on the larvae.

Mr. Daecke exhibited a male *Dytiscus harrisi* Kirby (Col.) collected at Highspire, Pa., June 17, 1910, by W. R. Fischer, which seems to be the only Pennsylvania record; also two

specimens of *Calobata geometra* Desv. (Dip.) collected by himself at Eberlys Mill, Pa., July 12, 1910, and July 14, 1910. This latter species was first turned up in Pennsylvania by Mr. Champlain. It is a Texas species and is gradually working its way north. Mr. Daecke also said he was in the vicinity of the place where he had found *Lema scirpunctata* Oliv. (Col.) on the Virginia day flower last year, and upon examining them found the same species this year.

Mr. Laurent described a yard in Wildwood Crest which contains several flower beds and covers about half an acre. He said that on October 6th, this year, this bed contained about 5000 specimens of *Danais plexippus* Linn. (Lep.) evidently gathering to migrate, because when he visited the same place next day none were to be found.

There then followed a general discussion by all present on the common house fly.

Mr. C. T. Greene exhibited and recorded the following Dip-tera collected by himself: *Phortica alboguttata* Wahlberg, from Lehigh Gap, July 12, 1906, a European species which Osten Sacken's Catalog says occurs in N. A. on authority of "Loew in litt"; *Phoranthia calyptrata* Coq. Castle Rock, Pa., September 26, 1909, listed from District of Columbia, Virginia and Kentucky; *Alophora nitida* Coq., Pemberton, N. J., July 11, 1909, listed from Potomac Creek, Virginia and Canada.

Dr. Skinner said he had been elected president of the section on Nomenclature at the Entomological Congress, in which all the discussions were in English, German, French and Spanish. He said it was the practice in many parts of Europe to label all the specimens which are under the eve at the time of description "type," but after much argument, pro and con, it was finally decided upon that a rule be passed to have only a single type. Adjourned to the annex.

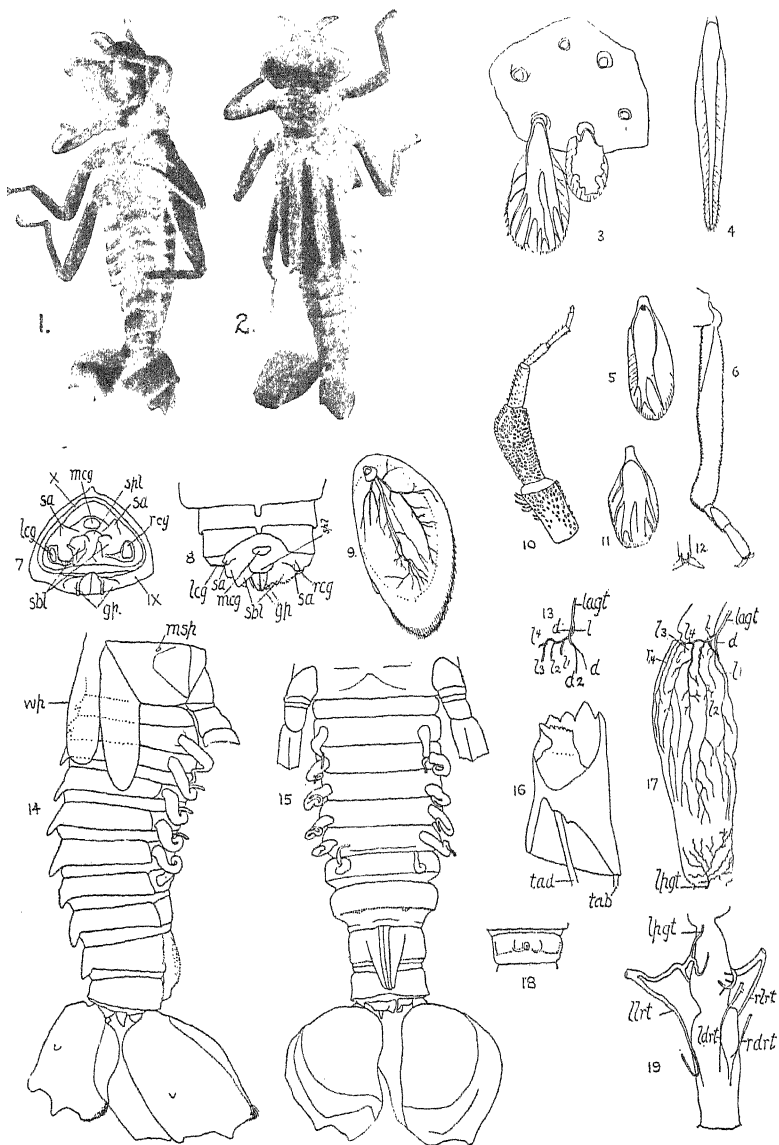
GEO. M. GREENE, *Secretary*.

ERRATA IN VOLUME XXI.

Page 467, line six from the bottom, for *foeresteri* read *foersteri*.

Page 469, for *Pterygophorus civetus* read *P. cinctus*.

Page 470, seventh line from bottom, for *discordal* read *discoidal*.



LARVA OF CORA (ODONATA)—CALVERT.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXII.

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Studies on Costa Rican Odonata.

I—The Larva of *Cora*.

By PHILIP P. CALVERT, PH. D.

University of Pennsylvania, Philadelphia, Pa.

(With Plates II and III)

In the course of our entomological researches in Costa Rica, a brief outline of which has already appeared in ENTOMOLOGICAL NEWS,* I collected some Odonate larvae of a form hitherto undescribed and which, it now appears, are certainly of the genus *Cora*. One of these was found at Peralta, Costa Rica, March 24, 1910, in a shallow brook in the woods west of the railroad station, clinging to a submerged stone. The altitude was about 335 meters, or 1100 feet. This larva died a few days later and was preserved in alcohol. A second is recorded in our diary, from Juan Viñas, April 27, 1910, as follows: "About half a mile farther [westward from the farther waterfall along the railroad from Juan Viñas station] is a third fall, or rather cascade, reached by a little trail through a bit of exceedingly thick damp woods full of wild ginger [*Costus* sp., Costa Rican name cañagria], heliconias,

* Vol. XXI, pp. 334-337, July, 1910.

ferns and caladiums. The stream is extremely pretty and ought to be a favorite haunt of many forest-loving species, but the day was very dark with intervals of rain and we saw no adult dragonflies. After long hunting among the fallen leaves and stones of the brook, P. found a larva with extra gills along the sides of the abdomen. This we suspect may be the larva of *Cora*, a point still to be determined however."

The diary for April 29, 1910, also at Juan Viñas, reads: "To-day was exceedingly dark and at times with very thick mist, altho' there was no heavy rain. While A. wrote in the morning, P. collected some food for some living dragon-larvae gathered here. While so doing he found another and somewhat larger larva of the sort which we suspect to belong to the genus *Cora*. It is remarkable in having attached to each side of some of the forward abdominal segments a finger-like gill, a peculiarity possessed by no other American dragon-larva as far as known. Our chief interest in larva-raising now centres on these two individuals."

Still at Juan Viñas, the diary of May 2, 1910, records: "With a lunch, rubber poncho and umbrella, the latter two for investigating the farther waterfall, I set out for that spot, examining the ditch along the [railroad] tracks which carries the water from this fall. In going and coming, I found in all three of the supposed *Cora* larvae in this outflow. Those found last week lacked the caudal gills which, altho' forming part of the proper equipment of a whole suborder of dragonfly larvae, seem to be of indifferent use and value, for many larvae lose them by accident or by the bite of a brother or an enemy and yet pass their larval existence as tranquilly and accomplish their transformations as successfully as their brethren. * * * The three larvae found to-day have their caudal, as well as their lateral, abdominal gills, which latter have already been briefly mentioned. The three caudal gills are very odd-looking. They appear as if cut off straight across the tip, instead of tapering as usual, the straight edge [*i. e.* tip] then scalloped into three points. Each gill is much inflated and, as the gills

are each [a fifth] as long as the short 'pudgy' body, the effect is to give the larva the appearance of 'tail-heavy.' When first taken into the hand these three larvae remained motionless, 'playing 'possum' as it were for a minute or two, and then took to their legs with some speed. In spite of their double equipment of gills, the *Cora* (?) larvae found do not frequent a different abiding place from less richly 'engilled' dragons, their fellow inhabitants being larvae of *Hetaerina*, *Argia* and common types of Libellulinae." The ditch in which these larvae were found was at this time one to two feet wide and rarely as much as eight inches deep; it contained many small stones on the under sides of which the larvae were found. The waterfall, whose outflow it was, was perhaps thirty feet high and was in turn fed by a stream descending in occasional cascades through forest from a height of several hundred feet higher. We took or saw imagos of *Cora chirripa* at this waterfall in different months, at previous visits, and on April 30 and May 2, 1910. The altitude at which all the *Cora* larvae from Juan Viñas were found was about 1000 meters, or 3300 feet.

On April 30, 1910, Mrs. Calvert went from Juan Viñas to our headquarters at Cartago, taking with her the *Cora* larvae of April 27 and 29, and placed them in our rearing jars. I followed on May 4 with the three larvae of May 2. At 6:50 P. M. of the same day occurred the great earthquake which destroyed Cartago. Its effect upon our larvae in rearing has been briefly described in the NEWS as quoted, but by the greatest good fortune the bottle containing the *Cora* larvae of May 2 was the single one—of all our living Odonata—that rolled out and escaped destruction from the fallen wall. Two of the larvae were alive and were carried in safety to our steamship at Port Limon. A second died May 7, and the third, with a supply of mosquito eggs to furnish food, started with us on the voyage to New York, but expired on May 14, three days before we landed. Each larva, as soon as its death was discovered, was placed in alcohol, but evidently was not in a condition for histological study. This fact must be remembered in judg-

ing of the shrunken condition of some parts, *c. g.* the tissues represented in figs. 20 and 25.

There thus have been available for the present description four larvae which may be designated as follows:

No. 1. ♂. Peralta as above, total length including antennae and caudal gills 16.5 mm.; length of body excluding the parts named 11.5 mm.

No. 2. ♀. Juan Viñas, May 2, in fragments.

No. 3. ♂. Juan Viñas, May 2, measurements as above, 20.5 and 17 mm. respectively.

No. 4. ♀. Juan Viñas, May 2, measurements the same as those of No. 3.

No. 3 has furnished dissections of internal organs. Nos. 1 and 4 have been kept almost intact.

DESCRIPTION OF THE LARVAE.

Head deeply concave posteriorly (Plate III, fig. 21) for reception of the prothorax. Compound eyes and ocelli distinct. Six pale yellowish spots indistinctly visible on the upper surface of the head, two in front of the median ocellus, one anterior to and one posterior to each lateral ocellus; some of these spots wanting in some specimens.

Antennae 7-jointed, but the last joint only visible under the compound microscope (Pl. II, fig. 10); ratios of the lengths of the joints, in a detached antenna under a cover-glass, 21, 26, 17, 11, 9, 5.5, 3; joints 1 to 6 successively decreasing in thickness; joints 1 and 2 clothed with a dense pile, which is longest in larva No. 1, and consists of flattened scales as shown in fig. 5. A similar pile is found on many other parts of the body, such as the anterior margin of the nasus, the lateral margins of the head posterior to the middle of the compound eyes, margins and ridges of the thoracic and abdominal segments, of legs and of wing-pads, a transverse ante-apical line on abdominal segments 1-10 for the entire width of the dorsum, much of the surfaces of the caudal gills, etc. This pile is longer and more conspicuous on larva No. 1 than on the other three. Joints 3-7 of the antennae have a decreasingly smaller amount of pile.

Mandibles stout two-branched, external branch larger, its apex with five teeth, first two teeth, counting from the dorsal margin, less distinct from each other than are the other three, fourth tooth longest. Internal branch in larvae Nos. 1, 3 and 4 larger on the *left* mandible than on the right mandible (right mandible lacking in larva No. 2) and on the left mandible its apex is truncated and with seven teeth or crenations, dorsal-most largest (Plate II, fig. 16). On the right mandible the apex of the internal branch is pointed and has only two teeth.

Maxillae with the inner lobe attenuate at tip, which bears three short internal teeth, and three long, slender, curved, internal processes and a row of strong setae. (Pl. III, figs. 29, 31). *Labium*, when folded at rest, reaching back to the bases of the prothoracic legs but not as far as the hind ventral prothoracic margin; median (mental) lobe but very slightly produced distad in the middle and with a very slight median cleft, distal margin crenulate with a very short seta between each crenulation and its neighbor; just within the crenulations a short distance on each side of the median cleft is a small pointed tooth (fig. 28, 1*) on the dorsal surface; mental setae few (2-4 on each side of the median line both on dorsal and ventral surfaces) and short; lateral lobes with a long curved tapering terminal spine and three distal teeth of which the most internal (mesial) is shortest and is truncate while the other two are pointed. (Pl. III, figs. 27, 28, 30).

Prothorax with three lateral tubercles, a dorso-lateral (*a*) which is dorsal to an antero-lateral (*b*) and, posterior to (*b*), a postero-lateral (*c*). On the mesothorax the place of *a* of the prothorax is occupied by the spiracle, *b* is present while *c* is represented by a double tubercle. None of these tubercles are represented on the metathorax which has an indistinct spiracle on its lateral surface (Pl. II, 14, *msp*). Front wing pads reach to the hind end of abdominal segment 6 in larva No. 1, to the hind end of segment 4 in larvae Nos. 3 and 4. Hind wing-pads reach almost to the mid-length of segment 7 in larva No. 1, to mid-length of segment 5 in Nos. 3 and 4. (In Pl. II, fig. 14, the wing-pads have been divaricated and are not in exactly normal positions, hence the difference between the preceding sentence and the figure). Legs not of a burrowing type, tarsi 3-jointed with an empodium-like structure (Pl. II, figs. 6, 12).

Abdomen triangular in cross-section, of ten complete segments, which decrease slightly in width from 1 to 8; 9 and 10 distinctly narrower owing to their lateral margins not being produced laterad as far as on the segments preceding (Pl. II, fig. 15). A curved, caudad-directed, mid-dorsal hook on segments 2-9 (larva No. 1) or 1-9 (larvae Nos. 3 and 4), hooks increasing in length from segment 1 or 2 to segment 7 or 8, that of 9 slightly shorter than that of 8. (Pl. II, fig. 14). Hind dorsal margin of segment 10 with a wide median notch whose depth is half, or less than half, the length of the segment. (Pl. II, fig. 8). Segments 2-7 each with a pair of tapering, finger-like ventral gills. Rudiments of ♂ genitalia on the ventral side of segment 2 indistinct in larva No. 1; in larva No. 3 they consist of two distinct black lines reaching from the intersegmental groove of 1-2 to behind the hind end of the sternite of 2. Rudiments of ♂ gonapophyses are present on segment 9 of larvae Nos. 1 and 3 (Pl. II, fig. 18). Rudiments of ♀ gonapophyses are shown in Pl. II, figs. 7, 8, 14, 15.

The three caudal gills together are much wider than the abdomen at its widest part. Each one is petiolate at base and much enlarged in all diameters beyond the petiole. *Median gill* approximately equal in length to that of segments 8+9+10, much enlarged dorso-ventrally and less so laterally immediately after the petiole, thence increasing in height gradually and slightly to the apex which is triangulate in profile view, the ventral angle most obtuse, the median angle most acute, the dorsal angle projecting not as far caudad as the other two. At a little less than half length from the base there is an angular protuberance on each side at about one-fourth height of the gill from the dorsal crest, so that there are in all five angular projections on this gill. Most of the chitin of this gill is brown and opaque, or at most only translucent, and is covered with scales, but on each of the two lateral faces there is an area of colorless transparent chitin occupying the ventral two-fifths of the height and about four-fifths of the length from the base caudad (Pl. II, fig. 14) lacking scales.

Each lateral caudal gill is somewhat longer than the median gill, roughly triangular in cross-section, one surface being convex, the other two approximately plane. These latter two are ventral and internal (mesial) respectively, the convex surface is lateral (external) and dorsal and greater in extent than either of the other two. There are four angular protuberances: one at half-length, or a little less than half-length, of the gill on the middle of the convex dorso-external surface; one at three-fourths of the length of the gill on the convex surface close to the margin of the mesial surface; one at seven-eighths of the length of the gill on the middle of the convex surface; and one, the most obtuse, forming the apex of the gill. The convex dorso-external surface of the gill is of brown chitin and scale-covered, the ventral and mesial surfaces chiefly of colorless, transparent chitin and lacking scales, except along the margins where each meets the dorso-external surface respectively. (Pl. II, figs. 3, 4, 9, 14, 15).

Between the bases of the three caudal gills are the rudiments of the superior appendages or 'cercoids' of the imago (Pl. II, figs. 7, 8, *sa*) and the supra-anal (*spl*) and sub-anal (*sbl*) laminae. The rudiments of the 'cercoids' are simple, cylindrical or conical, with rounded apices, and vary in length, in the four larvae, from about one-third to more than one-half of the length of abdominal segment 10. The sub-anal plates reach to about mid-length of the 'cercoids'; each one is depressed, its apex squarely truncate but produced apparently into a short spine at its mesial angle when viewed dorsally or ventrally; this apparent spine is the end view of a vertical lamina.

The main abdominal *tracheal* trunks and their branches are shown in Pl. III, figs. 22, 20; Pl. II, figs. 9, 17, 19. The ventral gills of abdominal segments 2-7 receive each two tracheae from two separate

branches of the main lateral trachea and the gill tracheae divide and redivide inside each gill (Pl. III, figs. 20, 25, 26). Owing to the opacity of the chitin, the thickness of the gills and the obstacles met in clearing them, I have not been able to make out more than the main branches of the tracheae supplying the caudal gills (Pl. II, fig. 9). The stomach is supplied from two anterior and two posterior tracheae, one anterior and one posterior on its right side and similarly on its left side. The right and left anterior gastric tracheae lie parallel and close together on the dorsal surface of the oesophagus and crop; each is probably a derivative from the main dorsal trunk of its own side of the body, but this was not definitely ascertained. At the anterior end of the stomach each anterior gastric trachea divides into a set of (two) dorsal and a set of (four) lateral branches as shown in Pl. II, figs. 13 and 17. The fourth, or ventralmost, lateral branch apparently forms an anastomosis with the corresponding branch of the opposite side of the stomach.

The hind-gut or intestine is likewise supplied by branches from the main dorsal tracheal trunks. The trachea which passes to the ileum also furnishes the posterior gastric trachea for the same side of the stomach. The rectal epithelium appears to form three (glandular?) dorsals and two laterals. (Fig. 19, *rdrt*, *ldrt*, *rlrt*, *llrt*). After the drawings forming figures 13, 17 and 19 were made, the alimentary canal was slit open lengthwise, stained, dehydrated, cleared and mounted in balsam. No definite indications of rectal tracheal gills were found and the rectal walls appear much less richly tracheated than those of the stomach. The rectal epithelium appears to form three (glandular?) areas. The gastric epithelium was disintegrated. No food was found in the alimentary canal.

The three thoracic pairs of ganglia are clearly distinct from each other. Posteriorly are seven pairs of smaller ganglia, located as follows: 1 in metathorax, 2 in anterior part of abdominal segment 2, 3 in hind part of segment 3, 4 at the articulation of segments 4 and 5, 5 in anterior end of segment 6, 6 in anterior end of segment 7, 7 in the middle of segment 8. The nerve cord in the male larva dissected (No. 3) passed to the right of the distinct rudiments of the genitalia projecting dorsad into the cavity of segments 1 and 2.

DISCUSSION OF THE MORE INTERESTING FEATURES OF CORA LARVA.

In current classifications *Cora* is placed in the Calopterygidae or Calopterygidae (= Agrioninae of the catalogues of Kirby, Muttkowski, etc.). Most of the Calopterygine larvae

hitherto described (Cf. Karsch, 1893, pp. 42, 48; Needham, 1903*b*, p. 220) have the first antennal joint very long, as long as all the other, or as several of the other, joints added together. *Cora* larva has the first antennal joint shorter than the second and in this respect, as in others mentioned below, shows a resemblance to the Old World larvae described by Hagen (1880, p. lxxv) as pertaining to the legion *Euphaea** of de Selys, and to a Mexican fragment doubtfully referred to *Cora* (*l. c.*, p. lxxvi).

The scales forming a more or less dense pile on different parts of the body of *Cora* larvae are structures which have met little or no notice in the literature on the Odonata. They occur in shapes varying from almost hair-like to that in which the width is at least more than half the length (Cf. Pl. II, figs. 4, 5, 11, 3 in the order named). The central and more or less arborescently-branched portion of each scale is thicker than the often hardly discernible marginal areas.

Biramous mandibles hitherto have been noted only in *Euphaea* larvae of all the Odonata, and that very briefly (Needham, 1903*a*, p. 743). I am not able at present to determine whether the two-branched condition there is the same as that here described for the larvae of *Cora* or not. The remarkable features of these mandibles is the possibility of independent movement of the inner branch along the dotted line shown in Pl. II, fig. 16, and the difference in the form of this branch in the right and left mandibles of the same individual noted above. Heymons (1896 *b*, taf. II, fig. 29) has figured the mandibles in a young larva of *Ephemera vulgata* which are also two-branched but, in contrast to the larval mandible of *Cora*, the inner branch is larger than the outer.

The very shallow median cleft of the median lobe of the labium was hardly to be expected in larvae so apparently primitive in other features as our *Cora* larvae are. In this respect also it agrees with *Euphaea* larvae, as far as can be

* The name of the type genus of this legion, *Euphaea*, is now replaced by *Pseudophaea* Kirby.

judged from Hagen's description (1880, p. xlv). If Miss Butler's theory (1904, pp. 114, 119) of the homologies of the labium be correct, then the small, pointed teeth (Pl. III, fig. 28 *t**) near the middle of the distal margin, would represent the apices of the original laciniae. The interpretation of Börner (1909, p. 113) is different and is essentially that of Gerstäcker, Heymons and others.

Hagen (1880, p. lxxv) noted the existence of "une *plantula* entre les onglets" of *Euphaea* larvae and remarked (p. lxxvii) "La présence d'une *plantula* entre les onglets est aussi un caractère unique chez les Odonates." The empodium-like structure mentioned above for *Cora* and shown in Pl. II, fig. 12, appears to be an homologous part.

The existence of tracheal gills on abdominal segments 2-7 is the most interesting feature of *Cora* larvae. The only Odonata previously known to possess such structures are the larvae referred to *Euphaea* and *Anisopleura* in the very brief description of Hagen (1880). One of these larvae was figured by Folsom in Packard (1898, p. 469). Hagen stated that there were gills on abdominal segments 1-8, Folsom found them on 2-8 only. There are, therefore, one pair less in *Cora* larvae. Hagen compared these gills of *Euphaea* and *Anisopleura* to those of *Sialis*, but makes no mention of Ephemerid larvae in this connection. Heymons (1896 a, pp. 88-90) compared the abdominal gills of Ephemerid and *Sialis* larvae, regarded them in both cases as derived from abdominal appendages and noted the agreement in the pointed form of the gills of the early larval stages of both groups. The gills of the second to seventh abdominal segments of *Cora* larva furnish an addition to this parallel. That the lateral gills of Ephemerid larvae are homologous with the thoracic legs is not universally accepted, however. Dürken (1907, 1909) and Börner (1909 a) are the latest representatives of the two views which look upon the Ephemerid lateral gills as dorsal and not homologous with legs and as ventral and homologous, respectively. We may not compare the lateral gills of *Euphaea*,

Anisopleura and *Cora* larvae with those of the Ephemerid larvae until much fuller data are at hand regarding the detailed structure, position, musculature and tracheation of each. The present study of *Cora* larvae supplies much fuller information than exists for either of the other two Odonate genera mentioned. The markedly ventral position of the gills in question in *Cora* is in itself some evidence against homologizing these structures with those of the Ephemeridae and in favor of their own serial homology with thoracic legs. No traces of these gills are present on the exterior of the abdomen of imagos of *Cora* preserved in alcohol immediately after capture.

The caudal tracheal gills of *Cora* larvae are very different in shape from the similarly situated gills of all other Odonate larvae yet described, including those of *Euphaea* (cf. Folsom's figure, *l. c.*) and *Anisopleura*, of which latter I possess a photograph from Hagen's specimen, taken and given to me by Prof. J. G. Needham. In both of these latter two genera the caudal gills taper posteriorly to an acute apex.

As related in the opening pages of this paper, the attempt to rear these larvae to transformation was unsuccessful. That they are the larvae of *Cora* and, so far as the Juan Viñas specimens at least are concerned, the larvae of *Cora chirripa* Calvert (1907, p. 348) is rendered practically certain from a comparison of the wing-rudiments of larva No. 4 with those of an imago of this species taken at the same ditch April 30, 1910. The left hind wing-pad of larva No. 4 was slit open, the wing rudiment removed from within and examined in alcohol under the compound microscope. The inner and outer surfaces of the rudiment gave the views represented in Pl. III, figs. 23 and 24 respectively. The veins shown in these figures are bands of reddish-brown pigment granules in the rudiment itself. The left hind wing of the imago mentioned was compared with camera drawings of the two surfaces of the wing-rudiment of the larva. At first the identification of the larval wing veins proceeded slowly until it occurred to me that per-

haps the two surfaces of the wing rudiment might present only convex and concave veins respectively. Turning then to the imaginal wing the following lists were made proceeding in every case from the anterior toward the posterior wing margin. Convex veins: proximal half of the wing, C, R₁, R_s, M₄, A and Cu₂; distal half, C, R₁, M_{1a}, two supplementary sectors, R_s, three supplementary sectors, M₄, Cu_{2a}, Cu_{2b}.

Concave veins: proximal half of wing, Sc, M₁, M₃, Cu₁; distal half, M₁, two supplementary sectors, M₂, one supplementary sector, M₃, two supplementary sectors, Cu₁, one supplementary sector between Cu_{2a} and Cu_{2b}.

As is well known the inner surface of the wing-pad and wing-rudiment of an Odonate larva corresponds to the upper surface of the imaginal wing, and the outer surface in the larva to the under surface in the imago. On comparing the list of convex veins with the drawing of the inner surface of the wing-rudiment and the list of concave veins with that of the outer surface of the wing-rudiment, it was seen that a close correspondence existed with these exceptions: that C (costa) showed on both surfaces, as also did a thickening all along the posterior margin and to greater or less extents Sc (sub-costa), R₁ (first branch of radius), M₁ (first branch of media), A (anal), Cu_{2b} and the supplementary sector between Cu_{2a} and Cu_{2b}. The wing-rudiment was then cleared in cedar oil and examined in strong transmitted sunlight, when the vein-rudiments of both inner and outer surfaces could be seen from either surface by proper focussing, whereas before clearing only those of the surface turned up toward the lens could be discerned. All the vein-rudiments now appeared in their proper sequence giving the alternation of convex and concave veins so easily seen in an imaginal wing. Careful focussing also revealed the fact that at this stage the veins are developed only upon one surface of the wing-rudiment, either inner or outer, except in the case of the costa and of the thickening along the hind margin. The other exceptions noted above are all veins near the margins where the wing-rudiment is thinner

and where they can be seen through it. Even in these exceptions the veins appear fainter and narrower on one surface than the other and are stronger and wider on their proper surface, *e. g.* Sc and M₁, concave veins, on the outer surface; R₁, A and Cu_{2b}, convex veins, on the inner surface.

Another fact shown by these comparisons and the figures is that the cross-veins only appear continuous from one longitudinal vein to another when the two longitudinal veins so connected are two, one of which immediately follows the other in the imaginal wing. (Cf. the cross-veins between R₁ and M₁ and between M₁ and M₂ in Pl. III, fig. 24.)

It would thus appear that each longitudinal vein develops on one surface of the wing-rudiment before it appears on the other surface. Before transformation is reached each vein has formed on both surfaces of the future wing but not necessarily equally on both surfaces, as may be seen from Hagen's figures (1889) from photographs of wings split into their two laminae immediately after transformation and expansion.

These facts of the development of the veins on one surface of the wing-rudiment before the other have a practical value in identifying Odonate larvae by this method and do not seem to be included in Prof. Needham's (1904, p. 687) suggestions on this point.

In the larva of *Cora* there exist the following generalized features: antennae with no hypertrophied joint, biramous mandibles, paired ventral tracheal gills (if they be morphologically equivalent to legs), and perhaps the empodium-like part, side by side with specialized features in the form of cuticular scales, almost completely fused halves of the labium and thickened, shortened caudal gills. If to these generalized parts of the larva we add the generalized features of the imaginal venation pointed out or implied by Prof. Needham (1903a, pp. 731, 746), we have good grounds for looking on *Cora* and its allies as being in many respects the most primitive of living Odonata.

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EXPLANATION OF PLATES II AND III.

Larva of *Cora*.

Fig. 1. Left latero-ventral view of larva No. 4 ♀.

Fig. 2. Dorsal view of larva No. 3 ♂. Right caudal gill lacking.

Figs. 1 and 2 from photographs of alcoholic specimens. × 2.6.

Fig. 3. Small fragment of surface of left caudal tracheal gill, larva No. 3, showing two scales and four articular pits for others. $\times 210$.

Fig. 4. Scale from same gill as fig. 3. $\times 210$.

Fig. 5. Scale from first antennal joint shown in fig. 10. $\times 210$.

Fig. 6. First left tibia and tarsus of larva No. 4. $\times 8.5$.

Fig. 7. End view, hind end of abdomen of larva No. 2 ♀, caudal gills removed. $\times 8.5$.

Fig. 8. Dorsal view, hind end of abdomen of larva No. 2 ♀, caudal gills removed. $\times 8.5$.

Fig. 9. Left caudal gill, ventro-mesial view, combined from drawings from larvae Nos. 1, 2, 3, to show tracheation. The dotted line indicates the boundary between a central, clearer, unscaled area and an opaque, scaled margin. $\times 5.8$.

Fig. 10. Right antenna, dorsal view, larva No. 3, ♂. $\times 16.5$.

Fig. 11. Scale from tibia or tarsus of fig. 6. $\times 210$.

Fig. 12. Ventral surface of distal end of tarsus. $\times 8.5$.

Fig. 13. Dorsal view of branches of left anterior gastric trachea shown in fig. 17. \times about 12.5.

Fig. 14. Right lateral view of metathorax and abdomen of larva No. 4, ♀. $\times 5.5$.

Fig. 15. Ventral view of same. $\times 5.5$.

Fig. 16. Left mandible, mesial surface, larva No. 2, ♀. $\times 21$. The dotted line shows the line of flexure of the internal branch.

Fig. 17. Left side of stomach to show tracheation, larva No. 3, ♂. \times about 12.5.

Fig. 18. Ninth abdominal segment to show gonapophyses, larva No. 3, ♂. $\times 5.5$.

Fig. 19. Left latero-dorsal view of intestine to show tracheal supply, larva No. 3, ♂; Malpighian tubules omitted. \times about 12.5.

Fig. 20. Right gill of fifth abdominal segment, larva No. 3, ♂. The gill has been left untouched, the viscera of the segment removed with the exception of the tracheae supplying the gill. To the left of *chr* a portion of the chitinous ventral wall of the segment is shown, to the right of *chr* is a portion of the tergite which has been turned outward (laterad) to show the structures within the segment. The portions of the two main tracheal trunks *rdt* and *rlt* have been turned outward to give a clearer view of the branches to the gill. Compare with the fifth abdominal segment in fig. 22. \times about 23.

Fig. 21. Dorsal view of head, larva No. 4, ♀. The dotted lines show the outlines of pale marks. $\times 7.8$.

Fig. 22. Dorsal view of chief thoracic and abdominal viscera, larva No. 3, ♂. The body has been opened along the mid-dorsal line. The ganglion has been omitted from second abdominal segment, the

wing-pads from left side, the dorsal longitudinal abdominal muscles from the right; not all of these muscles (*dlm*) are shown even on the left side. $\times 7.8$.

Fig. 23. Inner surface of left hind wing-rudiment (= upper surface of imaginal wing) with the outline of its enveloping wing-pad, *wp*, larva No. 4, ♀. $\times 12.4$.

Fig. 24. Outer surface of the same (= under surface of imaginal wing). $\times 12.4$.

Fig. 25. Transverse section of right gill of sixth abdominal segment of larva No. 3, ♂. $\times 55.5$.

Fig. 26. Transverse section of chief tracheal trunk of same gill in section immediately following that shown in fig. 25. $\times 55.5$.

Fig. 27. Distal end of lateral lobe from fig. 30. $\times 28$.

Fig. 28. Inner (dorsal) surface of distal end of median lobe from fig. 30. $\times 28$.

Fig. 29. Distal end of left maxilla from fig. 31. $\times 25$.

Fig. 30. Ventral (outer) surface of labium, larva No. 2, ♀. $\times 8$.

Fig. 31. Left maxilla and hypopharynx, ventral view, larva No. 2, ♀. $\times 13$.

Abbreviations Used in the Plates.

A, Anal vein (= proximal part of second sector of triangle of Selys).

chr, Chitinous ridge forming lateral margin of an abdominal segment.

Cu1, Cu2, First and second branches of cubitus vein (= first and distal part of second sectors of triangle of de Selys).

d, *d1*, *d2*, Dorsal branches of *lagt*.

dlm, Dorsal longitudinal muscles.

gm, Gill muscle fibres.

gp, Gonapophyses.

gt, Gill trachea.

im, Interarticular membrane between first antennal joint and head.

IX, Ninth abdominal segment.

l, *l1-l4*, Lateral branches of *lagt*.

lagt, Left anterior gastric trachea.

lcg, Point of attachment of left caudal gill.

ldt, Left dorsal trachea.

ldrt, Left dorsal rectal trachea.

llt, Left lateral trachea.

llrt, Left lateral rectal trachea.

lpgt, Left posterior gastric trachea.

M1, *M2*, *M3*, *M4*, Branches of media vein (= principal, nodal, median and short sectors of de Selys respectively).

M1a, Branch of *M1* (=ultra-nodal sector of de Selys).

mcg, Median caudal gill.

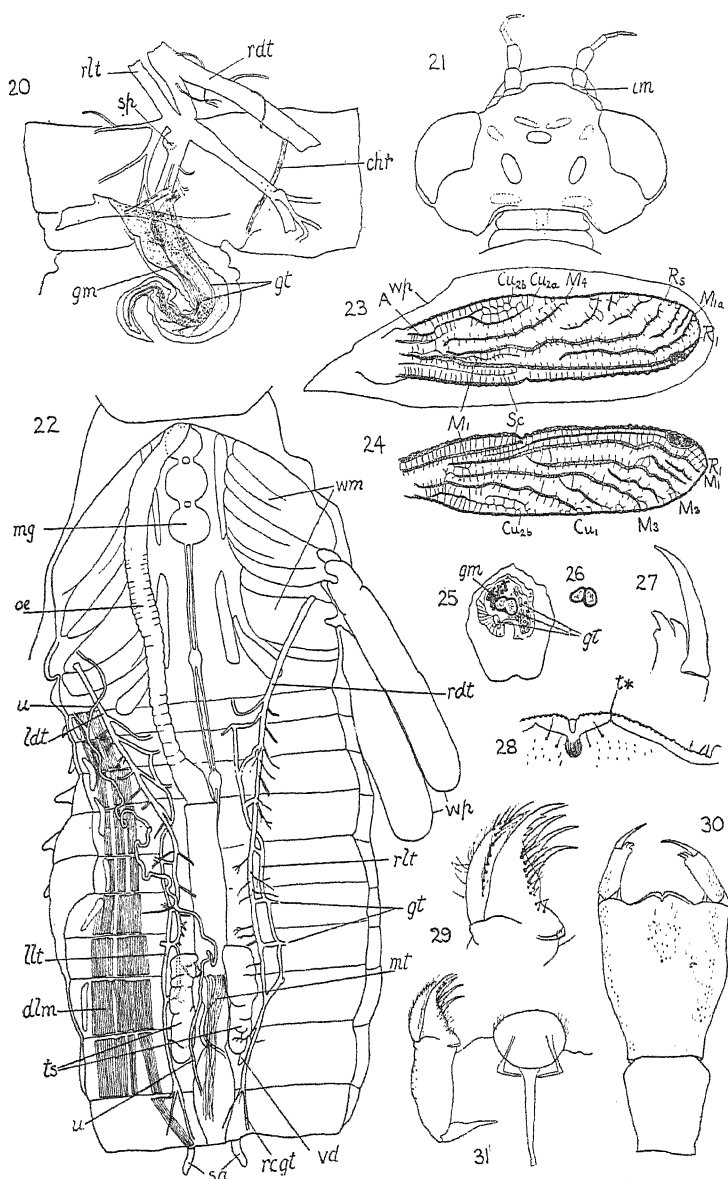
- mg*, Metathoracic (+ first abdominal?) ganglion.
m_{sp}, Metathoracic spiracle.
mt, Malpighian tubes.
oc, Oesophagus.
R₁, First branch of radius vein (= median vein of de Selys).
r₄, Fourth lateral branch of right anterior gastric trachea.
rcg, Point of attachment of right caudal gill.
rcyt, Right caudal gill trachea.
rdrt, Right dorsal rectal trachea.
rdt, Right dorsal trachea.
rlrt, Right lateral rectal trachea.
rlt, Right lateral trachea.
Rs, Radial sector (= sub-nodal sector of de Selys).
sa, Superior appendages of imago ('Cercoids').
Sc, Subcosta vein.
sbl, Sub-anal lamina.
sp, Site of future spiracle.
spl, Supra-anal lamina.
tab, Tendon of abductor mandibulae.
tad, Tendon of adductor mandibulae.
ts, Testes.
*t**, Tooth on median labial lobe.
u, Undetermined tube.
vd, Vas deferens (beginning of).
w_m, Wing muscle.
w_p, Outline of wing-pad.
X, Tenth abdominal segment.

The Tenth Pleocoma (Col.).

BY H. F. FALL.

On the 12th of last October, Mr. Chas. Camp, a student in the Pasadena High School, while repairing a trail in a small canon in the mountains near Sierra Madre, cut into a large beetle a few inches below the surface, the remains of which he brought to me for identification.

The specimen proved to be a female Pleocoma; a most interesting discovery, inasmuch as no representative of the genus had ever been found in this vicinity. One hundred and fifty miles north, along the South Fork of the Kaweah River



LARVA OF CORA (ODONATA)—CALVERT.

is the home of *P. hoppingi*; from the Cuyamaca Mts., one hundred miles south came the unique type of *P. puncticollis*, and in the Santa Monica Mts., near the coast, and not more than thirty miles distant a single wing cover of a *Pleocoma* has been picked up, showing the presence of the genus in that somewhat isolated range. The Sierra Madre Mts. ought then by good rights to harbor a species of this remarkable genus, but the obscure habits, and the ephemeral existence of the perfect insects has enabled them to escape detection up to this time.

In the absence of the male it was not possible to identify Mr. Camp's specimen with certainty, and he was urged to keep a sharp lookout for males during or immediately following the next rain. This was done, and on the 15th of November during a drizzling rain nineteen males were taken in about an hour at the same spot in an area not more than one hundred feet across. The beetles flew slowly and apparently aimlessly, keeping as a rule a foot or two above the ground. Mr. Camp was unable to define the extent of the flight, either in time or space, but there is little doubt that both were quite limited. Unfortunately no special attempt was made to locate the females, and it is doubtful if it will now be possible to secure any this season.

A careful study of the males indicates rather close relationship with *fimbriata* and *puncticollis*, but with a sufficiently marked and constant deviation from either to warrant a distinctive name. The following description and comparative notes are therefore offered:

P. australis n. sp.

Male.—Black, shining, glabrous above, the long hairs of the marginal fringe and under surface reddish brown. Antennae and cephalic structure very nearly as in *fimbriata*. Prothorax slightly more than twice as wide as long in horizontal projection, sides arcuately convergent in front, subparallel and feebly or barely perceptibly sinuate posteriorly, the hind angles obtuse but well defined and usually slightly prominent; disk flattened and obliquely declivous in front, the median line broadly vaguely impressed anteriorly and again more narrowly

so for a short distance at base; sides with the usual impression; surface closely moderately coarsely punctate throughout. Elytra obviously wider at base than the prothorax, varying from a little less to a little more than 3-10 longer than wide, sides nearly parallel, surface finely lightly punctured between the feebly defined geminate striae.

Length, $24\frac{1}{2}$ -28 mm.; width, $14-15\frac{3}{4}$ mm.

Female.—Castaneous, of the usual robust form; the clypeus more narrowly but very distinctly triangularly emarginate; surface sculpture rougher than in the male, as is usual.

Habitat. Bailey Canon, San Gabriel Mts., near Sierra Madre, California; elevation 2500 ft.

Compared with *fimbriata* the present species differs most conspicuously in the more coarsely and closely punctured thorax and smoother elytra; there are, however, a number of other differences which are evident on closer attention. Three males in my collection from Eldorado Co. are undoubtedly typical representatives of *fimbriata*; all these agree in being relatively broader than any of the new series; the prothorax is scarcely narrower than the base of the elytra, with the sides more rounded posteriorly and with ill defined hind angles, the cephalic horn is also longer and more slender than in *australis*, in which it is distinctly more triangular when viewed laterally. In all my typical *fimbriata* the third antennal joint is shorter than the next two combined; in *australis* it is equal to the next two, and in *puncticollis* it is said to be longer than the two following. *Puncticollis* differs conspicuously in having the long hair of the under body black.

THE COMMITTEE appointed to represent and look after the interests of the International Entomological Congress for the United States consists of Dr. Philip P. Calvert, Prof. T. D. A. Cockerell, Prof. J. H. Comstock, Prof. H. C. Fall, Prof. C. P. Gillette, Dr. W. J. Holland, Prof. A. D. Hopkins, Dr. L. O. Howard, Prof. C. W. Johnson, Prof. V. L. Kellogg, Prof. Herbert Osborn, Dr. John B. Smith, Dr. Ch. W. Stiles, Dr. Creighton Wellman, Dr. W. M. Wheeler. The committee for Canada is Dr. C. J. S. Bethune, Dr. C. G. Hewitt, Henry H. Lyman. The Permanent Executive Committee consists of Dr. Malcolm Burr, Dr. Walther Horn, Dr. K. Jordan, P. Lesne, G. Severin, Henry Skinner.

The Executive Committee will meet in Paris in August of this year to arrange for the Second International Congress to be held in Oxford, England, in 1912.

Descriptions of New Species of Cynipidae (Hym.).

By WILLIAM BEUTENMULLER, American Museum of Natural History, New York.

Dryophanta clavula, sp. nov.

Female.—Head rufous, infuscated along the face and on the vertex around the ocelli, evenly and finely reticulately punctate, sparsely hairy, eyes black. Antennae 14-jointed, first joint stout, short, second joint much smaller and stout, third to sixth joints long and slender, third longest; remaining joints short and subequal, dusky brown, somewhat darker toward the tip. Thorax pitchy brown, rufous posteriorly and anteriorly at the sides, microscopically pitted, especially anteriorly, shining and with scattered decumbent, yellowish hairs. Parapsidal grooves deep and distinct, widely separated anteriorly and running obliquely backward to the scutellum, where they are close together. Median groove wanting. Anterior parallel lines broad, shining, smooth and scarcely extending to the middle of the thorax. Grooves at base of wings scarcely evident. Scutellum subopaque, dull rufous, finely and evenly rugose with an almost imperceptible basal groove. Abdomen pitchy brown, somewhat rufous ventrally, smooth, shining; ventral sheath yellowish with long hairs. Legs dull yellowish brown with short hairs. Wings hyaline, pubescent, veins brown, heavily marked, especially the cross-veins; apical region with about seven small brown dots and a larger brown patch, and with three large brown clouds about the middle of the wings. Radial area closed with the veins thickened at the costa. Areolet present. Cubitus faint and extending to the first cross-vein. Length 1.5-2 mm.

Gall.—On the under side of the leaves of a species of white oak (probably *Quercus douglasi*). Monothalamous. Narrow and almost parallel to about the middle, thence suddenly becoming inflated into a club with the apex pointed. At the extreme base it is slightly broader and is attached by a point to the leaf. The gall very much resembles a miniature Indian club in shape. Brown in color, and the larva lives in the inflated part of the gall in a rounded cell. Length, 5-7 mm.; width of narrow part, 1 mm., of thickened part, 1.75 mm.

Habitat.—California (Napa and Sonoma Countries). Described from twelve specimens.

Type.—Collection U. S. National Museum.

Dryophanta multipunctata sp. nov.

Female.—Head yellowish brown, face broadly infuscated, eyes and ocelli black, microscopically, evenly granulose and pubescent. Antennae 14-jointed, first joint stout, second joint stout and much shorter than

the first; third joint very long and slender, fourth to sixth joints slender, subequal and shorter than the third; remaining joints gradually becoming shorter and slightly thicker toward the tip, pitchy brown black and pubescent. Thorax shining, finely and evenly pitted, with decumbent yellowish hairs, pitchy brown, somewhat rufous between the parapsidal grooves at the scutellum. Parapsidal grooves rather deep, widely separated anteriorly and converging at the scutellum, where they are moderately, widely separated. Anterior parallel lines very fine and indistinct. Lateral grooves distinct. Median groove wanting. Scutellum pitchy brown inclined to rufous, finely and evenly pitted, with yellowish hairs, basal groove not distinct. Abdomen pitchy black or dull rufous, smooth and shining dorsally, and covered with short pale hairs at the sides and venter. Legs pitchy brown or dull yellowish brown, pubescent. Wings hyaline, veins brown, cross-veins very heavy, outer portion of wings beyond the middle with many small brown spots, except in the radial area; about the middle of the wings two brown clouds situated on the veins. Areolet present. Cubitus continuous to the first cross-vein. Length, 2.75-3 mm.

Gall.—On the under side of the leaves of a species of oak. Monothalamous. Gray brown, spherical, sometimes slightly flattened at the base where the gall is attached to the leaf. The gall is irregularly wrinkled and covered with a dense, short and compact wooly substance and hairs. In general appearance it resembles the gall of *Philonix lanaeglobuli*. Diameter about 5 mm.

Habitat—Kern County, California, December 6th, 1892.

Type—United States National Museum.

Described from two specimens and two galls.

***Holcaspis chrysolepidis* sp. nov.**

Female.—Head, thorax and scutellum pale yellowish brown, abdomen somewhat darker with the dorsal region infuscated; legs slightly paler with the claws black. Antennae yellowish brown, terminal joints darker. Head very finely and evenly granulated, pubescent; ocelli and eyes black. Antennae 14-jointed. Thorax finely and evenly punctate with pale decumbent hairs. Parapsidal grooves very fine, less distinct anteriorly and almost parallel. Anterior parallel lines distinct, shining and extending to the middle of the thorax. Lateral grooves sharply defined, long and shining. Scutellum hairy, finely and evenly rugose. Abdomen shining, smooth, with a small patch of hairs at the base laterally. Legs pubescent. Wings long, yellowish hyaline, veins yellowish and are usually closely pressed together. Width 5-10 mm. Height 4-7 mm.

Gall.—On the twigs of oak (*Quercus chrysolepidis*). Monothalamous. Hard woody. Irregular in shape, somewhat rounded, sides flattened,

slightly oblique, ridged around the upper part of the sides, apex rounded. They occur singly and in rows of two, three, four or more, and are usually closely pressed together. Width 5-10 mm. Height 4-7 mm.

Habitat—Placer Co., California, November and December.

Types—United States National Museum.

Described from nine examples.

The gall of this species was figured by me in the Bulletin of the American Museum of Natural History, Vol. XXVI, plate VIII, figs. 8 and 9.

Philonix californica sp. nov.

Female.—Head pitchy brown black, minutely rugose with scattered, short hairs. Antennae 13-jointed; first joint stout, cylindrical; second joint shorter, stout and rounded at the tip; third joint very long and slender; fourth, fifth and sixth joints slender and shorter than the third; remaining joints gradually becoming shorter and thicker toward the thirteenth, all pitchy brown and pubescent. Thorax pitchy brown or dull rufous, evenly rugose, somewhat wrinkled and with a few scattered hairs. Parapsidal grooves very fine and somewhat lost in the rough surface anteriorly, convergent at the scutellum. Scutellum evenly rugose like the thorax, and of the same color. Abdomen compressed convex at the sides and rather sharply keeled on the dorsum and venter, dark pitchy brown, smooth and shining. Legs pitchy brown, somewhat paler than the abdomen and pubescent. Wings aborted, not extending to the middle of the abdomen. Length 1 mm.

Gall.—On the upper surface of the leaves of a species of white oak. Monothalamous. Rounded, flattened disc-like, becoming slightly elevated toward the middle. The sides are flat and very thin, and the gall rests closely on the leaf. The larva lives in the center of the elevated part. The color is pinkish or purplish, with the apex sometimes yellowish. Width, 3 to 4 mm. Height, 1 mm.

Habitat—Kern Co., California, January.

Type—United States National Museum.

Described from five females.

Andricus caepulaeformis sp. nov.

Female.—Head large, broader than the thorax, reddish brown, evenly and finely granulose. Antennae 14-jointed; first joint very stout and inflated; second joint short, subcylindrical; third joint very long and slender; fourth joint also slender, shorter than the third, remaining joints subequal, all blackish except the basal one which is rufous. Thorax minutely granulose with a few hairs. Parapsidal grooves pres-

ent, but not prominent, almost parallel. Anterior parallel lines scarcely evident. Median line running from the scutellum to about the middle of the thorax, not distinct. Pleurae with a large, smooth shining area. Scutellum rufous, rugose, foveae at base oblique and opaque. Abdomen reddish brown, posterior half piceous, smooth and shining. Legs reddish brown, long and slender, pubescent. Wings (immature) hyaline, veins brown. Length, 4 mm.

Gall.—In clusters around the twig of black oak (*Quercus velutina*). Monothalamous. Rounded with the apex pointed, and the sides longitudinally grooved. The rounded part is hollow and rather thin walled, and the base of the gall is imbedded in a cavity in the twig. Rose colored, hard and woody (when dry). In general appearance the gall resembles a very small seed onion. Length 5-8 mm. Width 4-5 mm.

Habitat.—Indiana. (Mel. T. Cook).

Andricus pisiformis sp. nov.

Female.—Head dark reddish brown, finely granulated and with short pale hairs. Antennae 13-jointed, reddish brown, terminal joints blackish. Thorax dark pitchy brown, reddish brown along the parapsidal grooves and laterally, minutely reticulated and with many pits, from each of which arises a short, decumbent, yellowish hair. Parapsidal grooves deep and well defined. Median groove distinct, and less so anteriorly. Lateral grooves deep. Anterior parallel lines not extending to the middle of the thorax. Scutellum reddish brown, rugose and with two large, deep, shining black foveae at the base. These are separated by a fine ridge. Pleurae pubescent, with a rather large shining area, pitchy brown. Abdomen subglobose, inflated, pitchy brown, smooth and shining. Legs brown, punctate and pubescent. Wings hyaline, veins brown, cross-veins heavy. Areolet small. Cubitus not reaching the first cross-vein. Length 2-3.50 mm.

Gall.—On the terminal twigs of white oak (*Quercus alba*) and post oak (*Quercus minor*) from the middle of May to early in June. Monothalamous. Spherical or pea-like. Milky white or pale greenish white, speckled and marbled with green or lilac. Fleshy when fresh, hard and woody when old and dry. It is hollow inside with no separate larval chamber. It is evidently a bud gall. Diameter 3-6 mm.

Habitat.—New Jersey (Lakehurst); Massachusetts (Boston).

The flies mature in the gall during the latter part of September and in October, but do not emerge until the following spring. The gall is a pretty object and looks like a very small marble. The specimens on white oak from Boston were collected by Miss Cora H. Clarke at the Arnold Arboretum.

Studies Amongst the Coccinellidae, No. 2, (Col.).

By F. W. NUNENMACHER, Piedmont, California.

Since my last paper on Coccinellidae* several friends and correspondents have sent me material in various genera including several species new to science, and as some of these are of considerable interest it seems worth while to publish the following descriptions at this time:

Genus PSYLLOBORA Mulsant.

Psyllobora koebelei n. sp.

♂.—*Color*: Whitish yellow with chocolate brown markings disposed as follows: Pronotum with the five common discal spots, each elytron with one juxta-scutellar and one median basal dot, one marginal small dot placed a little before the middle, and one irregular blotch roughly quadrate in form, placed its own width from the margin and close to the suture and rather behind the middle. Mouth parts testaceous; ventral surface black except mesothoracic episterna, which are white and last four ventral segments, which are testaceous, as are the legs. Form convex, subovate; *head*, impunctate; *pronotum* very finely and sparsely punctured; *elytra* moderately coarsely punctured; *ventral surface*, sternum moderately coarsely punctured; abdomen smooth.

Length, 2.25 mm. *Width*, 2 mm.

Type—♂ in my collection.

Type locality—Nogales, Santa Cruz Co., Ariz. vi. 02. (Koebele)

This species, which feeds on the scale infesting mistletoe, comes nearest to *P. luctuosa* Muls., from which it can readily be told by the elytral design. The type was kindly given me by Mr. A. Koebele in whose collection there are several specimens. According to his observations (No. 2426), this species, when alive, has a ground color of beautiful shimmering silvery green.

Genus AXION Mulsant.

Axion incompletus n. sp.

♂.—*Color*: Head light ferrugineous, pronotum and elytra black, the former with the anterior angles ferrugineous and a beaded line of the same color along the entire anterior margin, each elytron with a median double coalescing spot at the callus, nearer the margin than the suture, the shape of this spot being obliquely and roundly oblong with a prolongation towards the base of the elytron; ventral surface uni-

* See ENTOMOLOGICAL NEWS for April, 1909, p. 161 ff.

formly ferrugineous except the head, which is infusate, mesosternum, tibiae and tarsi piceous. *Form* as in *tripustulatus* DeG., head slightly nitid, almost impunctate; *maxillary palpi* black, last article inflated, somewhat flattened, truncate and excavated at apex; *pronotum* somewhat shining, almost impunctate; *scutellum* very small; *elytra* with texture as in head and thorax; *ventral surface* with sternum finely and thickly punctured, except the mesosternum, which is smooth and very nitid, ventral sternites finely, thickly and striately punctured except the base of the segments, which are smooth; fifth ventral rather deeply notched; *legs* with femora slightly rugose, tibiae smooth and sparsely pubescent.

Type—♂ in my collection.

Type locality—Lincoln Park Beach, Chicago, Ill., (Wolcott).

This form can be told at a glance from *tripustulatus* DeG. by the absence of the sutural spot. I owe the type to the kindness of my friend, Mr. Frederick Knab, of Washington, D. C.

Genus *HYPERASPIS* Chevrolat.

Hyperaspis lateralis, var. *flammula* n. var.

Color, structure and ornamentation as in *lateralis* Muls., except that the marginal vitta of each elytron is longer and is connected with the common discal spot by an isthmus of the same color as the vitta and spot; this isthmus rises from a point at about the posterior third of the vitta.

Type—♂ ♀ and one cotype (♀) in my collection.

Type locality—Montana.

Geo. Dist.—Montana, 2 specimens; Golden, Col. vii, 18. 09. one specimen (W. J. Gerhard).

I have seen examples of this variety in several collections in the east including the Horn collection of the American Entomological Society. The ♂ ♀ type was kindly given me by Mr. Chas. Liebeck of Philadelphia, the cotype from Colorado by my friend Mr. A. B. Wolcott. In the latter the elytral pattern shows slight signs of a reversion towards the typical design.

Hyperaspis wellmani n. sp.

Color: Shining black, elytra with reddish yellow markings, disposed similarly to those of *lateralis* Muls., except that the marginal vittae distinctly increase in width posteriorly and do not reach as nearly the

base of the elytra as in the species mentioned, also the discal and sub-apical spots are constantly smaller and regularly circular, ventral surface black except that portion of the reflexed margin of the elytra occupied by the marginal vittae. *Form* regularly oval; *head* very sparsely and minutely punctured; *pronotum* a little more heavily and thickly punctured; *scutellum* large with a few coarse punctures; *elytra* more thickly punctured than head, but less thickly than pronotum; *ventral surface* with mesosternum smooth, episternum of mesothorax very coarsely punctured. *Head* of ♂ chrome yellow, the anterior border of the pronotum narrowly, and the lateral borders heavily margined with the same color, the lateral margin not quite reaching the base, anterior pair of legs and tarsi of all yellowish.

♀.—Entirely black except elytral markings, tarsi dark fuscous.

Length.—♂ 2.5 mm., ♀ 3.1 mm.

Width.—♂ 1.7 mm., ♀ 2.1 mm.

Type.—♂ ♀ and five cotypes, one ♂ and four ♀ ♀, in my collection.

Type locality.—Goldfield, Esmeralda Co., Nevada, vi. 27. 07 (Nunenmacher).

In general form and markings the specimens are remarkably constant. I have many times bred *lateralis* and the larva of *wellmani* is strikingly different from that species. The following table will aid in separating the adults:

1. (2) Marginal vittae broad, not increasing posteriorly, episternum of mesothorax mediumly punctured, foveae for reception of hind tibiae rather shallow, size large and form more convex than the following species ***lateralis***
2. (1) Marginal vittae narrow, distinctly increasing posteriorly, episternum of mesothorax very coarsely punctured, foveae for reception of hind tibiae deep, size smaller and less convex than preceding species ***wellmani***

***Hyperaspis wolcottii* n. sp.**

♀.—*Color*: Head, pronotum and scutellum black, the pronotum with rather wide stramineous lateral margins, elytra piceous with stramineous markings arranged as follows: A wide marginal, strongly sinuous vitta extending from the humeral angle of each elytron to a point near the suturoapical angle; for about its posterior third, this vitta does not entirely reach the margin of the elytron; a narrow edging of the elytral ground color appearing outside of the vitta; the apical end of the vitta is constricted near the extremity tending to form an apical spot; a second straight juxta-sutural oblique vitta extends from the base of the elytron to about two-thirds its length, the obliquity being from near

the scutellum outwards and backwards; ventral surface uniformly dark fuscous, legs dark testaceous. *Form* narrowly oval, not very convex with sides subparallel; *head* shining, very sparsely and minutely punctured; *maxillary palpi* dark testaceous, last article securiform, the apex strongly pointed; *pronotum* very shining, rather more strongly densely punctured than the head; *scutellum* small with a few minute punctures; *elytra* much more coarsely and thickly punctured than the pronotum; *ventral surface*, sternum moderately coarsely punctured except mesosternum, which is smoother in center; episternum of mesothorax more heavily punctured, abdominal segments with bases rather smooth but becoming more coarsely punctured and pubescent towards the sides; *legs* with ridges, somewhat pubescent.

Length.—♀ 2.25 mm., width 1.25 mm.

Type.—♀ and two cotypes in my collection.

Type locality.—Buffington, Ind. (Pine Barrens) vii. 26. 10. (A. B. Wolcott).

This species can be readily separated from any of the other species by the elytral pattern and less convex subparallel form. The type was received from my friend, Mr. A. B. Wolcott.

Hyperaspis ploribunda n. sp.

♂ ♀—*Color*: Head, pronotum and scutellum black, elytra dark fuscous, palpi, antennae, tarsi and inflexed sides of elytra very dark testaceous. *Form*, oblong oval, depressed, somewhat widened posteriorly; *head* extremely finely, sparsely and shallowly punctured; *pronotum* finely and closely punctured; elytra less thickly and closely punctured than pronotum, the punctuation being thickest and coarsest towards the scutellum; the punctures are all very shallow; *ventral surface* sparsely and shallowly punctured.

♂ smaller than ♀, with sixth ventral slightly notched.

Length.—♂ 1.5 mm., ♀ 1.75 mm.

Width.—♂ 1.1 mm., ♀ 1.25 mm.

Type.—♂ ♀ in my collection.

Type locality.—Goldfield, Esmeralda Co., Nevada, vi. 29. 07. four specimens. (Nunemacher).

When I first collected these insects I thought they were specimens of *H. arcuatus* Lec.

I wish to express my thanks to my friend Dr. Creighton Wellman, of Oakland, for advice and criticism during the preparation of this paper.

Mallophaga from Californian Birds.

By V. L. KELLOGG and J. H. PAINE, Stanford University,
California.

The following determinations of Mallophaga and records of hosts are based on specimens taken from various birds at Monterey, California, by Mr. Jos. Clemans, Chaplain of the 15th Infantry Regiment, stationed at the Presidio.

Docophorus pertusus Nitzsch, var. *monachus* n. var.

One male from the Virginia rail, *Rallus virginianus* (Monterey, California).

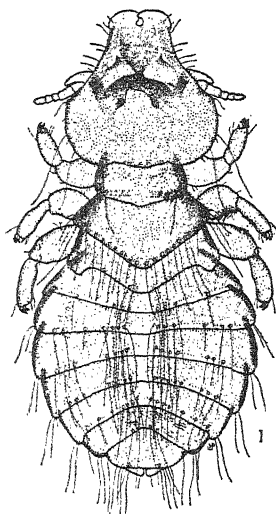


Fig. 1.—*Docophorus pertusus*
Nitzsch. var. *monachus* n.
var. Female.

The type, *D. pertusus*, has been found on the following birds in California: *Fulica americana*, *Erismatura rubida*, and *Colymbus nigricollis californicus*. The sinuous posterior margin of the first abdominal segment shown in the figure of the variety is also found in the type, though it has not been referred to heretofore.

The variety differs in the greater number of hairs found on the clypeus and on the abdomen. On the clypeus of the type there are two small hairs near the trabeculae while in the variety there are about eight on each side extending from the trabeculae to the expansion of the pincer-like organs. On the posterior margin of each segment of the abdomen in the type are found not more than four hairs while in the variety they are numerous, sixteen occurring on the fifth segment with the number diminishing anteriorly and posteriorly.

Docophorus pertusus Nitzsch.

One young specimen from the American coot *Fulica americana* (Monterey, Cal.)

Docophorus icterodes Nitzsch.

Specimens from the American coot, *Fulica americana* (Monterey, California.)

Docophorus platyrhynchus Nitzsch.

Specimens from the western red-tailed hawk, *Buteo borealis calurus* (Monterey, Cal.)

Docophorus communis Nitzsch.

Specimens from the shumagin fox sparrow, *Passerella iliaca undaschcensis* (Monterey, Cal.)

Docophorus mirus Kellogg.

Specimens from Townsend warbler, *Dendroica townsendi*, (Monterey, Cal.)

Docophorus singularis Kellogg and Chapman.

Specimens from the varied thrush, *Hesperocichla naevia naevia*. (Monterey, California).

Docophorus incisus Kellogg.

Specimens from the pied-billed grebe, *Podilymbus podiceps, cidentalis*, (Monterey, Cal.)

Nirmus fuscomarginatus Denny var. *americanus* Kellogg.

Specimens from the pied-billed grebe, *Podilymbus podiceps* (Monterey, Cal.); also (straggler?) from the varied thrush, *Hesperocichla naevia naevia* (Monterey, Cal.)

Nirmus furvus Nitzsch.

Specimens from Wilson snipe, *Gallinago delicata* (Monterey, Cal.); also from Virginia rail, *Rallus virginianus* (Monterey, Cal.)

Nirmus fuscus Nitzsch.

Specimens from the western red-tailed hawk, *Buteo borealis calurus* (Monterey, Cal.)

Nirmus foedus Kellogg and Chapman.

Specimen from the black phoebe, *Sayornis nigricans semi-atra* (Monterey, Cal.)' also (straggler?) from the pied-billed grebe, *Podilymbus podiceps* (Monterey, Cal.)

Nirmus vulgatus Kellogg.

Specimens from the Shumagin fox sparrow, *Passerella iliaca unalaschcensis* (Monterey, Cal.).

Oncophorus minutus Nitzsch.

Specimen from the American coot, *Fulica americana* (Monterey, Cal.); also (straggler?) from the western bluebird, *Sialia mexicana occidentalis* (Monterey, Cal.)

Oncophorus bisetosus Piaget, var. *californicus* Kellogg and Chapman.

Specimens from the Virginia rail, *Rallus virginianus* (Monterey, Cal.)

Lipeurus temporalis Nitzsch.

Specimens from the shoveller duck, *Spatula clypeata* (Monterey, Cal.)

Laemobothorium sp.

Two specimens from the desert sparrow hawk, *Falco sparverius deserticolus* (Monterey, Cal.) Until this genus is thoroughly revised we shall not attempt to make any species determination in it.

Physostomum sp.

One young specimen from Townsend warbler, *Dendroica townsendi* (Monterey, Cal.)

Trinoton luridum Nitzsch.

One specimen of this duck-infesting species, accredited, but certainly wrongly, to a desert sparrow hawk, *Falco sparverius deserticolus* (Monterey, Cal.) The insect probably came from the shoveller duck, *Spatula clypeata*.

Trinoton lituratum Nitzsch.

One specimen from the shoveller duck, *Spatula clypeata*, (Monterey, Cal.)

Colpocephalum stictum n. sp. (Fig. 2).

A single male specimen from *Gallinago delicata*, Wilson's snipe (Monterey, Cal.) This is an elongated species with conspicuous blotches on head, thorax and abdomen.

Description of Male.—Length 1.4 mm., width across abdomen .42 mm. Yellow brown in color with conspicuous dark chestnut markings.

Head.—Length .34 mm., width .4 mm., thus being unusually long in comparison with its width. Front slightly convex with three short

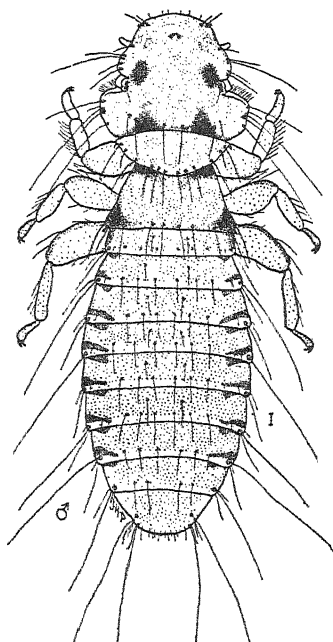


Fig. 2.—*Colpocephalum stictum* n. sp. Male.

spines on either side and two short hairs on the angles where the front merges into the diverging sides. The prominent ocular emargination is almost filled by the eye and the last segment of the antennae. Ocular blotches dark chestnut; ocular bands indistinct except where they broaden to form light brown blotches at their anterior ends. The ocular fringe extends around the angle on to the temples. Temples broadly rounded, occiput concave. Two occipital triangles of dark chestnut color connected by a dark band on the occipital margin and extending forward. Occipital bands wanting. There are four hairs on the angle before the ocular emargination, one larger than the others; five hairs on the temple, three long and two shorter; also two hairs on the occiput near the center.

Thorax.—Length .34 mm., width .34 mm. Prothorax lenticular, the anterior margin more flattened than the posterior, which latter bears a row of about twelve hairs. Metathorax trapezoidal; very dark chestnut blotches occurring in both anterior and posterior angles, and the latter angles bearing two hairs and a spine; also about six hairs on the posterior margin which is straight. Legs pale with a fringe of hairs on the outer edge of the tibia.

Abdomen.—Length .78 mm. Last segment rounded; lateral band of each segment, except the last, with two dark chestnut appendages curving inward, one at each end of the segment, becoming lighter in color in the posterior segments. Very long hairs in the posterior angles of some of the segments. A row of hairs across each segment and numerous short hairs around the posterior margin of the last segment. Transverse blotches slightly darker than general ground color of insect. Genitalia inconspicuous, being only slightly chitinized.

***Colpocephalum flavescens* Nitzsch.**

Two males from the desert sparrow hawk, *Falco sparverius deserticolus* (Monterey, Cal.)

***Menopon tridens* Nitzsch.**

Specimens from the pied-billed grebe, *Podilymbus podiceps* (Monterey, Cal.)

***Menopon tridens* Nitzsch, var. *pacificum* Kellogg.**

Specimens from the pied-billed grebe, *Podilymbus podiceps*, the common loon, *Gavia imber*, the shoveller duck, *Spatula clypeata*, the American coot, *Fulica americana* and (straggler?) the desert sparrow hawk, *Falco sparverius deserticolus*, all from Monterey, California.

***Menopon* sp.**

One specimen from the shoveller duck, *Spatula clypeata* (Monterey, California.)

A Remarkable Dragonfly (Odon.).

By CHARLES LOUIS POLLARD, Public Museum, Staten Island Association of Arts and Sciences, New Brighton, New York.

In the account of a collecting trip in North Carolina last year, presented before the New York Entomological Society on December 21, 1909, by Mr. George P. Engelhardt and myself, reference was made to the capture of a dragonfly, *Gomphoides ambigua* Selys, as being the first record of the occurrence of this tropical American species within the United States (see Journ. N. Y. Ent. Soc. v. 18, p. 130).

The specimen, a male, was taken with numerous other Odonata on the shores of Greenfield Pond, near Wilmington, N. C., on August 1, 1909. I am unable to recall the circumstances of its capture, as I was engaged in general collecting at the time, and did not recognize the insect as unusual. It was sent with other species to Mr. R. P. Currie, of the United States Department of Agriculture, who made the following comment in returning it:

"*Gomphoides ambigua* has been reported hitherto only from Mexico and Guatemala and is thus new to the United States. It seems strange that it should have been taken in North Carolina."

When recently examining the collection of Odonata in the museum of the Staten Island Association of Arts and Sciences, Mr. Charles Schaeffer was inclined to question the identification, basing his opinion on two Mexican specimens in the Brooklyn museum, which had been determined by Professor Philip P. Calvert, and which differed from the Wilmington insect. I thereupon sent the latter to Professor Calvert, who courteously replied at length, giving the results of his examination. The letter is of such interest that it is quoted in detail:

"The dragonfly from Wilmington, N. C., which you sent me for determination falls under *Gomphoides ambigua* Selys, by my key to the Mexican, Central American and West Indian species of this genus in the *Biologia Centrali-Americana*, volume Neuroptera. A comparison with specimens shows, however, that the Wilmington example, while possessing the very distinct median notch in the posterior dorsal margin of the last abdominal segment of *ambigua*, differs from *ambigua* and agrees with *producta* Selys of the West Indies in having the somewhat dilated lateral margin of the 9th segment (viewed laterally in profile) convex throughout, instead of being convex in its anterior half and concave in its posterior half. The sheath of the penis of the Wilmington male is projecting, viewed laterally, as it is in *producta* but not in *ambigua*. There is also a slight difference in the shape of the hind dorsal margin of the 10th segment * * * * *. The labrum, being chiefly pale green with only a narrow brown border on its free edge, is different from that of either *ambigua* or *producta*.

"*Producta* being the West Indian species, is what one would expect at Wilmington. From the above data your specimen seems to be intermediate between *ambigua* and *producta*. It is not outside the range of possibility that the

Wilmington male may belong to some species described from the female only. This is a difficult matter to decide in the absence of actual specimens of those species. I am, therefore, not able to say more than that your male does not agree with the descriptions or specimens of any male *Gomphoides*. * * *

"In any event, your Wilmington specimen is the most northern record for this genus known to me, and therefore a very interesting capture."

It is to be hoped that entomologists visiting the Wilmington region, and particularly the neighborhood of Greenfield Pond, will keep a sharp lookout for species of *Gomphoides* and related genera, as it is quite possible that the individual taken by me had been bred in the vicinity, and was not an accidental migrant from the West Indies.*

THE Department of Zoology and Entomology of the Ohio State University has recently received as a donation a fine collection of Lepidoptera from Mrs. Catherine Tallant, of Richmond, Indiana. The collection was made by Mr. W. M. Tallant during a series of years in the nineties and up to about 1905. It contains mainly species occurring in central Ohio, especially at Columbus, but has also a number of species from different parts of the United States and also some fine examples of species occurring in South America, Japan, China, India, Ceylon and Africa. The collection contains about 10,000 specimens in most excellent condition, very beautifully mounted, and many of the species contain very full series, showing variations, etc., which will make them of special value for scientific study. They are, for the most part, carefully identified, well preserved and will be kept under the name of the "Tallant Collection" in good cases and cabinets. Taken with the other collections in Lepidoptera, the collection of Odonata left by Professor Kellicott, and those in various groups which have been accumulated by the efforts of the members of the Department, the university is now provided with an excellent collection of insects including representatives in all the different orders. The total number of specimens probably approaches close to 100,000.—H. O.

*[According to Mr. Muttkowski's new catalogue of the Odonata of North America (Bulletin of the Public Museum of the City of Milwaukee, Vol. 1, art. 1) the name *Gomphoides* Selys must be transferred to what de Selys and others have called *Progomphus* Selys. For the old *Gomphoides* Mr. Muttkowski proposes *Negomphoides*. If my view, set forth in the 'Biologia,' that *Gomphoides* Selys, *Cyclophylla* Selys, and *Aphylla* Selys are but one genus be accepted, the name *Negomphoides* is superfluous as *Cyclophylla* has priority.—P. P. CALVERT.]

A new Chalcidid from an Oak Gall (Hym.).

By T. D. A. COCKERELL, University of Colorado,
Boulder, Colo.

The beautiful Chalcidid here described was bred by Mr. E. R. Warren, the well-known Mammalogist, from galls of *Holcaspis* on an oak (*Quercus undulata* Torrey) at Trinidad, Colorado. The galls are like those of *H. rubens*, Gillette, but the single fly obtained seems different.

Syntomaspis warreni n. sp.

♀.—Length (exclusive of ovipositor) 4 1-3 mm.; ovipositor 5 2-5 mm.; wings ample, perfectly clear, venation pale fulvo-ferruginous; head broad, peacock green, with faint crimson tints, frontal depressions behind antennae shining golden; eyes bright terra-cotta red; mandibles red except at apex; sides of face very minutely rugosopunctate, sides of front becoming striatulate; scape and ring-joint ferruginous; flagellum black, the joints very minutely longitudinally keeled; mesothorax and scutellum with large thimble-like punctures, variegated with green and crimson, the posterior part of the scutellum minutely granular, with microscopical punctures, and with a marginal sulcus crossed by fine ridges; other parts of thorax variegated with green and purple; anterior coxae brilliant green; hind coxae very large, crimson-purple; femora and tibiae bright chestnut red; tarsi cream color, rufescent subapically, black at apex; lower margin of hind femora minutely denticulate beyond the middle, but with no large tooth; abdomen brilliant magenta, with blue-purple shades. first segment with a very large flap, which is strongly notched posteriorly; second segment carinate, deeply notched in middle; third segment also deeply notched; hind tibiae with two spurs; stigma sessile; ovipositor chestnut-red, its sheath black.

Type in U. S. National Museum.

Mr. J. C. Crawford has kindly compared this insect with the material in the National Museum, and writes that it comes very close to *Syntomaspis californicus* Ashm., which is greenish or golden greenish, without the purple tints. The species is one of those which might be assigned either to *Torymus* or *Syntomaspis*.

AT THE ANNUAL MEETING of the Pennsylvania Horticultural Society held December 20th, in Philadelphia, Dr. Henry Skinner was re-elected Professor of Entomology for 1911.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, four weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—Ed.

PHILADELPHIA, PA., FEBRUARY, 1911.

The versatility of insects is well shown by the inducements which they hold out to man to serve as the objects of his most varied study. From papers and references in this number of the NEWS we find them continually increasing his catalogues of animal forms, exercising his ingenuity to escape their unwelcome personal attentions to his body, serving as the material for experiments on the method and manner of inheritance or for the examination of minute details of the structure of the living cell, illustrating complicated problems of physics, disturbing his ideas of the operations of climatic influences upon life. All these branches of human intellectual activity are of the larger Entomology wherein each of us who reads these lines tries to do his part.

DR. A. A. MICHELSON, of the University of Chicago, delivered the seventh lecture upon the J. C. Campbell Foundation of the Sigma Xi Society of the Ohio State University on the evening of December 2. His subject was "Metallic Colors in Birds and Insects." The lecture was amply illustrated by lantern and reflectoscope and was concluded by an explanation of the most probable cause as found by the lecturer as a result of his researches.—*Science*, Dec. 23, 1910.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

THE Liverpool School of Tropical Medicine has been able to offer Liverpool University \$50,000 for the establishment of a chair in Tropical entomology. At a meeting of the Council of the University it was resolved gratefully to accept the offer.—*Science*, Jan. 6, 1911.

ANNOUNCEMENT of the Journal of Animal Behavior and the Animal Behavior Monograph Series.—In response to a widely felt and urgent need for a periodical in which studies of the behavior and mental life of organisms may satisfactorily be published a journal and a monograph series have been planned. The Journal of Animal Behavior will accept for publication field studies of the habits, instincts, social relations, etc., of animals, as well as laboratory studies of animal behavior or animal psychology. It is hoped that the organ may serve to bring into more sympathetic and mutually helpful relations the "naturalists" and the "experimentalists" of America, that it may encourage the publication of many carefully made naturalistic observations which at present are not published, and that it may present to a wide circle of nature-loving readers accurate accounts of the lives of animals. Beginning with January, 1911, the Journal will appear bi-monthly in numbers of approximately 75 pages. Each annual volume of six numbers will consist of not less than 450 pages. The subscription price will be \$3.00 per volume (foreign, \$3.50). This low price to subscribers can be maintained only if those who are interested in the study of the behavior and psychology of animals promptly subscribe and work for the support of the Journal. The Journal is under the editorial direction and management of I. Madison Bentley, Assistant Professor of Psychology, Cornell University; Harvey A. Carr, Assistant Professor of Psychology, University of Chicago; Samuel J. Holmes, Assistant Professor of Zoology, University of Wisconsin; Herbert S. Jennings, Henry Walters Professor of Zoology, Johns Hopkins University; Edward L. Thorndike, Professor of Educational Psychology, Teachers' College of Columbia University; Margaret F. Washburn, Professor of Psychology, Vassar College; John B. Watson, Professor of Experimental and Comparative Psychology, Johns Hopkins University; William M. Wheeler, Professor of Economic Entomology, Harvard University, and Robert M. Yerkes, Assistant Professor of Comparative Psychology, Harvard University. The Journal is not the property of any individual, and it is to be conducted solely in the interests of those branches of science which it represents. All income from subscriptions and other sources, above that necessary for the support of the pub-

lication as it is planned, is to be devoted to its improvement and enlargement. Reviews of especially important contributions within its field will be published as they are prepared, and, in addition, a number especially devoted to reviews, digests, and a bibliography of the contributions to animal behavior and animal psychology for the year will be published annually. This review number is to be in charge of an Editor of Reviews. It is hoped that this special number may prove of value to those readers whose library facilities are meager. The Animal Behavior Monograph Series will be published in connection with the Journal as a provision for papers which are too lengthy, or, for other reasons, too costly to be accepted by the Journal. The monographs of this series will appear at irregular intervals, and they will be grouped in volumes of approximately 450 pages. The separate monographs will be sold at prices determined by the cost of manufacture, and the volume will be sent to regular subscribers for the price of \$3.00 (foreign, \$3.50). Subscribers to the Journal are urged to subscribe also to the Monograph Series. The Journal of Animal Behavior and the Animal Behavior Monograph Series will be published for the Editorial Board by Henry Holt and Company, New York. Manuscripts for the Journal may be sent to the managing editor, Professor Robert M. Yerkes, Emerson Hall, Cambridge, Massachusetts, or to any other member of the Editorial Board. Manuscripts for the Monograph Series should be sent to the editor, Professor John B. Watson, the Johns Hopkins University, Baltimore, Maryland, from whom information may be obtained concerning terms of publication. Books and other matter for review in the Journal should be sent to the editor of reviews, Professor Margaret F. Washburn, Vassar College, Poughkeepsie, New York. All business communications should be addressed to the Journal of Animal Behavior, Cambridge, Mass.

NOTES ON *LIMNOBIA PARIETINA* O. S.—The splendid crane-fly, *Limnobia parietina* O. S., has always been regarded as somewhat of a rarity. It was described by Baron Osten Sacken in 1861, from specimens taken at Trenton Falls, N. Y., "on fences, in September, numerous ♂ and ♀ specimens." It has since been recorded from the White Mountains, New Hampshire, and more recently (1909), Prof. C. W. Johnson has added a few more records: Prout's Neck, Me.; Intervale and Hampton, N. H., and Lake Ganoga, North Mountain, Pa. I have mentioned the occurrence of the species in Fulton County, N. Y., in ENT. NEWS for June, 1910. I have the following notes to add:

In early September, 1910, a friend and I were on a long fishing tramp up into Hamilton Co., N. Y. On the morning of the 2d, while passing from Silver Lake, near Arietta, to the White House on the

west branch of the Sacandaga River, I noticed an abundance of a large Tipulid flying about in the dense woods. They proved to be *Limnobia parietina*. The woods along Nine-Mile Creek were dark and gloomy, and very little sunshine penetrated to the ground below. When the *parietina* passed from the shadows into the bright sunlight they looked very large and conspicuous. There were hundreds of specimens about, and they were the only large crane-fly in this sort of habitat. They would fly lazily from some resting place, and usually alight on the trunk of some nearby tree, head upward. I picked seven ♂'s and one ♀ from such places, or seized them as they flew slowly past. It is a notable late summer species, all of the records being for late August or September.—CHAS. P. ALEXANDER, Ithaca, N. Y.

THE COLEOPTERORUM CATALOGUS, published by W. Junk, Berlin, edited by S. Schenkling, began publication September 15, 1909. Up to January 1, 1911, the following parts have appeared: 1. R. Gestro, Rhysodidae; 2. F. Borchmann, Nilionidae, Othniidae, Aegialitidae, Petriidae, Lagriidae; 3. Alleculidae; 4. M. Hagedorn, Ipidae; 5. R. Gestro, Cupedidae et Paussidae; 6. H. Wagner, Curculionidae, Apioninae; 7. H. von Schönfeldt, Brenthidae; 8. van Roon, Lucanidae; 9. E. Olivier, Lampyridae; 10. E. Olivier, Rhagophthalmidae, Drilidae; 11. A. Léveillé, Temnochilidae; 12. E. Csiki, Endomychidae; 13. Scaphidiidae; 14. M. Pic, Hylophilidae; 15. H. Gebien, Tenebrionidae I; 16. P. Pape, Brachyceridae; 17. Ph. Zaitzev, Dryopidae, Cyathoceridae, Georyssidae, Heteroceridae; 18. E. Csiki, Platypsyllidae, Orthoperidae, Phaenoccephalidae, Discolomidae, Sphaeriidae; 19. M. Bernhauer et K. Schubert, Staphylinidae I; 20. A. Schmidt, Aphodiinae; 21. K. Ahlwarth, Gyrinidae; 22. H. Gebien, Tenebrionidae II; 23. H. Bickhardt, Histeridae. Part 24, S. Schenkling, Cleridae, is announced for immediate publication. All the other families are in preparation. The publisher thinks that there is little doubt that the "Catalogus" will be completed in about six years. Supplements will be published regularly after completion of the work. The literature on the biology and development of beetles, chiefly of the injurious species, will be listed with special care.

THE announcements of the Free Lectures of the Ludwick Institute to be given in 1911 at the Academy of Natural Sciences of Philadelphia, contain the following references, direct or indirect to Entomology.

Scientific Explorers of America and Their Discoveries. By Henry A. Pilsbry, Sc.D., Special Curator, Department of Mollusks, Academy of Natural Sciences, Philadelphia. Illustrated by lantern slides. Mondays at 8 P. M. February 13: Voyages of the XV., XVI., XVII. Centuries and their Geographical Discoveries. Illustrated with reproductions of interesting early maps and charts, showing the progress of knowledge of western geography. February 20 and 27: Zoological and Botanical Explorers and Writers of the XVI. and XVII. Centuries—Hernandez, Sir Hans Sloane, Bartram, etc. March 6: The Great Explorers of South and Central America and their Zoological Discoveries. March 13: Early North American Explorations.

Entomology. By Henry Skinner, M.D., Conservator, Entomological Section, Academy of Natural Sciences, Philadelphia. Illustrated by

colored lantern slides. Thursdays at 8 P. M. February 16: Lepidoptera, Butterflies and Moths; their life histories, habits, transformations and distribution. February 23: Economic Entomology: Insects of the Household and the Farm; Crop and Fruit-tree Pests; the San Jose scale, gypsy moth, brown-tail moth, tussock moth and other shade-tree pests. March 2: The Social Insects or Hymenoptera, Bees, Wasps and Ants; their habits, architecture and communities. March 9: Insects and Disease. Parasitism. Ticks and mites in relation to Texas fever, spotted fever and relapsing fever. Horse-flies, stable-flies, punkies, blow-flies, jiggerfleas, bed-bugs. House-flies in relation to typhoid fever and tuberculosis. March 16: Insects and Disease. Mosquitoes, their life history; mosquitoes in relation to malaria, yellow fever and filaria. Sleeping sickness and the tsetse fly. Some tropical diseases transmitted by insects.

Animal Coloration and Its Significance in Evolution. By J. Percy Moore. Illustrated by lantern slides. Thursdays at 8 P. M. March 23: Physical and Physiological Basis of Animal Color. Color in Relation to Function and Environment. Color Patterns. March 30: Non-adaptive and Adaptive Coloration. Types of Adaptive or Useful Coloration. April 6: Concealing Coloration. April 13: Warning Colors. Mimicry, etc. Changeable Colors. Dichromatism and Related Phenomena. April 20: Behavior of Color in Heredity. Conclusion.

Has anyone had any experience with gas lamps used for attracting moths? I am thinking of buying a 2,000-candlepower gasoline lamp to use in catching moths. A friend of mine in Chicago thinks a gas lamp will not attract moths, at least not nearly so many as an electric or kerosene lamp will do. He claims the light is too white. I am anxious to hear from someone who has had actual experience.—A. F. PORTER, Decorah, Iowa.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), excluding Arachnida and Myriapoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted. This (*) following a record, denotes that the paper in question contains description of a new North American form.

For record of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

2—Transactions, American Entomological Society, Philadelphia.
4—The Canadian Entomologist. 5—Psyche, Cambridge, Mass. 6—Journal, New York Entomological Society. 7—U. S. Department of Agriculture, Bureau of Entomology. 11—Annals and Magazine of Natural History, London. 16—Bulletin, Societe Nationale d'Ac-

climation de France, Paris. 18—Ottawa Naturalist. 22—Zoologischer Anzeiger, Leipzig. 24—Berliner Entomologische Zeitschrift. 38—Wiener Entomologische Zeitung. 40—Societas Entomologica, Zurich. 45—Deutsche Entomologische Zeitschrift. 47—The Zoologist, London. 55—Le Naturaliste, Paris. 81—Biologisches Centralblatt, Erlangen. 84—Entomologische Rundschau. 92—Zeitschrift für wissenschaftliche Insektenbiologie, Berlin. 97—Zeitschrift für wissenschaftliche Zoologie, Leipzig. 102—Proceedings, Entomological Society of Washington. 143—Ohio Naturalist, Columbia. 179—Journal of Economic Entomology. 180—Annals, Entomological Society of America. 183—The Glasgow Naturalist. 189—Pomona Journal of Entomology, Claremont, Cal. 193—Entomologische Blätter, Nürnberg. 216—Entomologische Zeitschrift, Stuttgart. 278—Annales, Societe Zoologique Suisse et du Museum d'Histoire de Geneve, Revue Suisse de Zoologie. 279—Jenaische Zeitschrift für Naturwissenschaft, Jena. 287—Proceedings, Royal Society of Victoria (new Series), Melbourne. 301—Verhandlungen und Mitteilungen des Siebenburgischen Vereins für Naturwissenschaften zu Hermannstadt. 302—Mitteilungen, Naturwissenschaftlichen Vereins an der Universität Wien. 303—Entomologische Mittheilungen, udgivne af Entomologisk Forening, Copenhagen. 304—Annals, Carnegie Museum. 305—Deutsche Entomologische National-Bibliothek, Berlin.

GENERAL SUBJECT. Bablu, E.—Die wirbellose terrestrische Fauna der nivalen Region, Ein Beitrag zur Zoogeographie der Wirbellosen, 278, xviii, 761-916. Jacobson, E.—Hilfsmittel beim Fang und Präparieren von Insekten, besonders in den Tropen, 305, i, 91-95. Kerr, J. G.—List of species of insects described by J. C. Fabricius from specimens in Dr. Hunter's collection, 183, ii, 101-111. Przibram, H.—Experimental-zoologie, 3. Phylogenese (inklusive Hereditat), 315 pp., 1910, Leipzig. Rhumbler, L.—Ueber eine zweckmassige Weiterbildung der Linnischen binären Nomenklatur, Ein vorläufiger Vorschlag, 22, xxxvi, 453-471. Skinner, A.—The use of insects and other invertebrates as food by the No. American Indians, 6, xviii, 264-267. Swinton, A. H.—The vocal and instrumental music of insects, 47, xiv, 299-306, 426-432 (continued).

APTERA & NEUROPTERA. Bottger, O.—Das Gehirn eines niederen Insektes (*Lepisma saccharina*), 279, xlvi, 801-844. Chamberlin, R. V.—Diplopoda from the western states, 180, iii, 233-276 (*). The Chilopoda of California I., 189, ii, 363-374 (*). Crawford, D. L.—American Psyllidae II (*Triozinae*), 189, ii, 347-362 (*).

ORTHOPTERA. Bruner, L.—South American Tettigidae, 304, vii, 89-143. Criddle, N.—The migration of some native locusts, 18, xxiv, 164-166. Severin & Severin—The effect of moisture and dry-

ness on the emergence from the egg of the walking-stick (*Diapheromera femoratus*), **179**, iii, 479-481. **Zacher, F.**—Tiergeographische, phylogenetische und biologische Bemerkungen zu Malcolm Burr's Dermapterenfauna von British Indien, Burma und Ceylon, **84**, xxvii, 174-176.

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MOSQUITO OR MAN? THE CONQUEST OF THE TROPICAL WORLD.—In spite of all the interest aroused in the past decade on the subject of the relation of insects to disease, authoritative discussions, which, at the same time are thoroughly interesting for the non-technical reader, are rare. There has recently appeared such a book, which holds one's interest from beginning to end,—Sir Rubert Boyce's "Mosquito or Man."* By ability to present the facts in a readable, popular style, no less than by a broad first-hand knowledge of his subject, the author, who is dean of the Liverpool School of Tropical Medicine, is peculiarly qualified.

It is in the field of tropical medicine that the application of the discoveries of the relations of insects to the transmission of disease has been most far-reaching, and Sir Rubert has fittingly given his book the sub-title "The Conquest of the Tropical World." After a brief discussion of the foundation of the tropical medicine movement in England, he traces the growth of general and applied sanitation in the tropics and emphasizes that the greatest value of measures along this line has been in the fact that indirectly and incidentally they resulted in a reduction in numbers of disease-carrying insects. For instance, modern methods of obtaining water supplies have resulted in a great reduction of yellow fever throughout the West Indies in the past fifty years. But, "the significance of the relationship of the diminution of yellow fever to the introduction of pipe-borne water is due entirely to the fact that there has been of necessity a diminution of the common breeding places of the house mosquito—the *Stegomyia calopus*—the sole carrier of yellow fever."

An entertaining and concise account of the discoveries which underlie our present knowledge of insects as carriers of disease is preceded by a chapter on "Miasm, Tradition and Prejudice." As one who has taken part in many campaigns against disease Dr. Boyce has good reason to know the depth to which the old doctrine of the miasmatic origin of malaria and yellow fever is rooted.† The popular mind is not yet freed from the idea of "the deadly miasm, which surrounds you on all sides, which you encounter at its worst in the cool eventide or early morning," and even yet, in many regions, it is regarded as a matter of course that the newcomer must fall a prey to the "acclimation fever." On account of this deep-seated belief in man, the pioneer finds it far more easy to overthrow the strongholds of the disease-carrying

* *Mosquito or Man? The Conquest of the Tropical World.* By Sir Rubert Boyce, M.B., F.R.S. London, 1909. John Murray. \$3.50.

† One of our best dictionaries in its revised, 1909 edition, defines malaria as a fever produced by "morbific exhalations arising from swamps or effluvia from the decomposition of animal or vegetable matter."

mosquito than to overthrow this deep-seated prejudice, which begets apathy and indifference, characteristic of the tropical countries where these diseases are so prevalent.

But now, in all parts of the world the campaign against insect carriers of disease is being waged. Most instructive are the accounts—often from personal experience—which the author gives of the results of this movement. For instance, the early history of yellow fever shows in some epidemics a mortality rate of 69 per cent. It was not from want of good food or water, or accommodation that men perished. "No, they were struck down by some unseen hand, and medicine said that that hand was the miasm. Today we know it to be the mosquito and whereas formerly, acting on the miasm theory not one life was ever saved, today, armed with the new knowledge, we visit the miasmatic countries with the same feeling of security that we do when we pay a visit to the continent."

A valuable feature is the discussion of plans of campaign against the guilty mosquito. Especially interesting to the American reader is the detailed account of the fight against yellow fever in New Orleans, in 1905, in which Dr. Boyce, as volunteer, played an important part. The book is not limited, as its title would imply, to a consideration of the mosquito in the transmission of disease but considers also, though briefly, the part played by other insects—the tsetse-fly, the rat flea, ticks, and the housefly. The hookworm, too, is briefly included in the discussion.

Altogether, the volume is a fascinating one and should be read by every one who wishes to keep in touch with the advances of preventative medicine. He will put it down with the conviction that the author is justified in his claim that the tropical world, long retarded in its development by its reputation as "the white man's grave," is today being steadily and surely conquered. "The three great insect-carried scourges of the tropics—the greatest enemies that mankind has ever had to contend with, namely malaria, yellow fever and sleeping sickness—are now fully in hand and giving way, and with their conquest disappears the awful and grinding depression which seems to have gripped our forefathers. * * * The tropical world is unfolding once again to the pioneers of commerce who now do not dread the unseen hand of death as did old the Spanish Conquistadores of Columbus and Cortes."—WM. A. RILEY, Cornell University.

ANNUAL REPORT OF THE NEW JERSEY STATE MUSEUM, INCLUDING A REPORT OF THE INSECTS OF NEW JERSEY, 1909.—This contains the Curator's Report; Insects, their Classification and Distribution and a Systemic List of the Insects of the State, Alphabetical Index to Localities,

Explanations of Abbreviations and Acknowledgments, Summary and Index. This is another edition of Prof. John B. Smith's well known New Jersey list of insects. Two previous lists have appeared, the first in 1890 and the second in 1900. The first list contains the names of 6098 species, the second 8537 and the present list 10385. The work is intended to aid students and collectors and also to encourage the study of entomology, particularly economic, among teachers, farmers, fruit growers and other persons who should be interested in this important subject. The success of this State list has led to similar records being kept in other States, with a view of publication, and sooner or later, we will see them in print. Work of this kind will greatly enhance our knowledge of distribution and will be useful in the study of many problems connected with both economic and systematic entomology.—H. S.

Doings of Societies.

FELDMAN COLLECTING SOCIAL.

At a regular meeting held November 16th, 1910, at 1523 South Thirteenth street, Philadelphia, fifteen members were present. President Harbeck in the chair.

Mr. H. A. Wenzel spoke of a collecting trip made in August to Pocono Lake, Pa., in company with Mr. Greene, of Easton, and mentioned the interesting species collected. Among the rarer were *Aphodius leopardus* Horn, *A. rubripennis* Horn and *Dialytes striatulus* Say, all collected in cow manure along the trails in the thick woods. The latter was also taken under the fallen needles of the pine. These three species had been previously taken by himself and father at high altitude in Balsam Mountains, N. C. He went thro' five or six ant hills with no success. Found three or four species of *Necrophorus* on dead animals and in traps. Mr. H. W. Wenzel said that *A. rubripennis* was a mountain species and by no means common; had previously been recorded as found only under bear dung; also made some remarks on and displayed his collection of *Geotrupes* and a pupa of one, probably *G. semiopacus* Jec.; described the tunnelling of species of this genus and, when they strike an obstruction in the shape of a stone, the manner in which they dig around it.

Mr. Daecke said he had found *Cicindela rufiventris* Dej. on the top of a mountain near Harrisburg; was surprised to find it there as it is found in just the opposite conditions in New Jersey.

Mr. Harbeck said since finding at Trenton, N. J., the sawfly with "four antennae" recorded at the October, 1909, meeting, he had found another at the same place and one at Manahawkin; he questioned whether they were all freaks or whether there was a genus with this characteristic.* This led to a general discussion on the subject of freaks including mammals, plants and insects. Adjourned to the annex.

GEO. M. GREENE, Sec'y.

AMERICAN SOCIETY OF ZOOLOGISTS.

At the eighth annual meeting of the Eastern Branch, held at Cornell University, Ithaca, New York, December 28-30, 1910, the following papers of an entomological character were read: Dr. N. M. Stevens (Bryn Mawr College) Heterochromosomes in Mosquitos. Contrary to the previous experience of the speaker that when heterochromosomes were found in one member of a genus or family of Coleoptera, Diptera or Hemiptera, they are also to be found in other members of the same group, she found heterochromosomes clearly differentiated in *Anopheles* but not differentiated in *Culex* and *Theobaldia*; this non-differentiation was used as an argument against the idea that heterochromosomes are sex-determinants. Prof. T. H. Montgomery, Jr. (University of Pennsylvania), Origin and significance of Mitochondria. This granular constituent of cells was studied in living sperm cells of *Euschistus* (Hemipteron) and was considered to be due not to an extrusion of chromatin from the nucleus but probably to a chemical interaction between nuclear and cytoplasmic material; it was suggested that cells receiving much mitochondria may become somatic cells, those receiving little mitochondria may become

* Mr. E. T. Cresson stated, without having seen these specimens, that they were perhaps males of *Lophyrus*.—Eds.

germ cells. Prof. P. P. Calvert (University of Pennsylvania), Newly Found Odonate larvae of special interest from Costa Rica. Larvae of *Cora* with anterior abdominal tracheal gills and of *Mecistogaster modestus* from water between leaf bases of arboricolous bromeliads were described and the transformation of the latter species shown by a series of photographs from life. Dr. A. Petrunkevitch (Yale University) The senses, courtship and mating in tarantulas, and A case of regeneration in tarantulas, illustrated by very interesting photographs and demonstrations. Prof. T. H. Morgan (Columbia University), The origin and heredity of four wing mutations in *Drosophila*, and The heredity of red eyes, white eyes and pink eyes in *Drosophila*.

At the meeting of the American Society of Naturalists held in conjunction with the Eastern Branch of the Zoologists, Prof. Morgan contributed a paper also dealing with *Drosophila* under the title: The application of the conception of pure lines to sex-limited inheritance and to sexual dimorphism, while Prof. J. H. Gerould (Dartmouth College) spoke on Polymorphism and inheritance in *Colias philodice*.

For the meetings of the Central Branch of the American Society of Zoologists in conjunction with Section F, Zoology, A. A. A. S., held at Minneapolis, Minn., December 28, 29 and 30, 1910, the following entomological papers were announced: J. F. Abbott (Washington University), Poulton's Theory of the Origin of Mimicry in Certain Butterflies; S. R. Williams (Miami University), Comparison of the Arrangement of the Eggs in the Nests of *Japyx* sp. and *Scutigerella immaculata*; S. J. Hunter (University of Kansas), On the Transition from Parthenogenesis to Gametogenesis in Aphids. II. (Lantern); Fernandus Payne (University of Indiana), The Pomace Fly Bred in the Dark for 67 Generations; C. E. McClung (University of Kansas), Chromosome Individuality; J. A. Nelson (U. S. Dept. of Agriculture), Origin of the Rudiments of the Mesenteron of Honey Bee; W. J. Baumgartner (University of Kansas), Spermatogenesis in the Mole Crickets.

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Address at the Dedication of the Entomology and Zoology Building of the Massachusetts Agricultural College, Nov. 11, 1910.*

By L. O. HOWARD, U. S. Dept. of Agriculture, Washington, D. C.

WHEN Professor Fernald began to teach entomology in the Maine State College at Orono, in 1872, there was only one other teacher of the subject in the United States, and that was Dr. Hagen, at Harvard, who had only an occasional student. Of earlier attempts to teach entomology on this side of the Atlantic there is little of record. W. D. Peck lectured at Harvard in the earlier years of the last century, and after 1831, T. W. Harris, while librarian of Harvard, had a private class in entomology, meeting one evening a week, and on Saturday afternoons went with his class in good weather on a ramble. Colonel Higginson writes: "Doctor Harris was so simple and eager, his tall spare form and thin face took on such a glow and freshness; he dwelt so lovingly on antennæ and tarsi and handled so fondly his little insect martyrs, that it was enough to make one love this study for life beyond all branches of natural science."

* Reprinted from *Science* for December 2, 1910.

Teachers of natural history of those days had to cover botany, zoology, geology, human physiology, chemistry and natural philosophy. Collections and apparatus were practically non-existent. The publication of Harris's "Insects Injurious to Vegetation" in 1841, classic though it was, aroused no great interest in the study of insects, and it remained for Packard's "Guide to the Study of Insects," published in Salem in 1869 and written by a young and enthusiastic worker inspired by Agassiz's training, to place entomology in America on a footing so that the subject could be competently studied and taught. The influence of Louis Agassiz in fact, perhaps even more than is generally realized, was enormous in the development of interest in natural history in America, and entomology no less than the other branches of the subject felt its stimulating effect. Moreover, the Smithsonian Institution in those older days under Joseph Henry did much by the publication in its "Miscellaneous Collections" of the works of Morris, Osten Sacken, Loew and Le Conte to help the labors of the earlier group of workers.

So we find the elder Fernald beginning to teach entomology at the Maine State College in 1872, and a year later J. H. Comstock began to teach it at Cornell. Fernald, however, was professor of natural history and he had to teach all sorts of things, while Comstock was confined to entomology and invertebrate zoology. Thus, while Fernald was one of the early teachers of entomology, Hagen was really the first professor of this subject with Comstock as second. But it is not my plan to discuss precedence in this direction. I wish to show how recent are the beginnings of the study and how rapidly it has advanced. As it happens, I was Comstock's first student, and we began to work together in a little cramped room in the autumn of 1873, with little material, few books and a poor microscope for our equipment. At the Agassiz Museum, Hagen had his excellent library and good collection, and he had Crotch and Schwarz and Hubbard, and a little later, Samuel Henshaw working with him. Fernald was working single-handed off in Maine. A few economic entom-

ologists were busy—Fitch in New York, Riley in Missouri, Le Baron in Illinois and Glover in Washington. The systematic workers and those who studied the habits of insects were more numerous—Le Conte, Horn, Osten Sacken, Lintner, V. T. Chambers, E. T. Cresson, S. H. Scudder, W. H. Edwards and his colleague T. L. Mead, Henry Edwards, A. R. Grote and his colleague Coleman T. Robinson, P. R. Uhler, H. F. Bassett, R. H. Stretch, F. G. Sanborn, S. S. Rathvon, Cyrus Thomas, H. C. McCook, G. R. Crotch, H. Behr, C. Zimmerman, George Dimmock, C. S. Minot, P. S. Sprague, F. Blanchard, C. A. Blake, Edward Norton, H. Shimer, T. Meehan, E. D. Cope, E. P. Austin, J. Behrens, Jas. Ridings, A. J. Cook, W. V. Andrews, Edward Burgess, L. F. Harvey, F. H. Snow, G. Lincecum, J. H. Emerton, Mary E. Murtfeldt, G. M. Dodge, C. R. Dodge, Thomas G. Gentry, H. K. Morrison, A. S. Fuller, E. L. Graef, and, across the border in Canada, Abbé Provancher, William Saunders, Rev. C. J. S. Bethune, William Couper and E. Baynes Reed were about all.

And it must be remembered that nearly all of these men had had no training and were scientifically untaught; nearly all were engaged in professions or in business, and that entomology was but a side issue and not the sole interest of their lives—in fact with many of them it was simply an amusement, a fad. But I do not intend to detract from the value of their work. They and their few predecessors laid a strong systematic foundation for the work which has been done since, and for that which is still to come. It should be pointed out, however, that, systematically speaking, whole groups of the North American entomological complex were unknown. The Coleoptera and Lepidoptera and certain families in the Diptera and Hymenoptera had been studied by these men, but a field of unknown greatness remained unexplored.

Something must be said also of the influence of the unusual personality of some of these men in attracting others to the study. I have in mind especially Rev. J. G. Morris and Henry Ulke, neither of whom is mentioned in the list; Morris because at that period he had stopped publishing and Ulke

because he had not published at all. Both of these men, rarely attractive, lived long, Morris dying in 1895 at the age of ninety-two and Ulke in the present year at eighty-nine, and both of them undoubtedly made entomologists of others by their personal charm and enthusiasm.

There were then in 1873 three teachers of entomology, two of them just beginning, three state entomologists, one of them (Fitch) already at the end of his work, a government entomologist, who, on account of his mental make-up, was adding little to the progress of the science, and a small body of amateur entomologists engaged in all sorts of occupations, but whose systematic work as a whole compared favorably in quality with that of the workers of other countries. The *Canadian Entomologist* had been started, and the American Entomological Society was publishing good entomological papers.

At the present time, after thirty-seven years, what a change is to be seen! In the place of the few score self-trained entomologists, there is now an army. The American Entomological Society is still in existence, and publishes, in addition to its *Transactions*, an admirable entomological journal, *Entomological News*. The Entomological Society of Washington has been founded, with its quarterly *Proceedings* now well along in its twelfth volume. The Albany Entomological Society, the New York and Brooklyn societies, the California Entomological Society, the Society of Southern Economic Entomologists and the great Association of Economic Entomologists with its list of foreign members in all parts of the world and its universally-read *Journal of Economic Entomology*, and, latest of all, the Entomological Society of America with its large list of members and fellows and its entirely competent annals and its representation the present year at the first International Entomological Congress—all have sprung into healthy and progressive existence since those days.

In place of the two active state workers in economic entomology, Le Baron in Illinois and Riley in Missouri, and of the single government entomologist, there is now in practically

every state in the union an efficient entomological staff composed of trained men; and at Washington there is a corps connected with the Bureau of Entomology comprising six hundred and twenty-three individuals, of whom one hundred and thirty-one are trained entomologists. In certain states, notably California, there are even county and district entomologists. It is safe to say that in 1873 there were spent by states and the general government for entomological work not to exceed ten thousand dollars a year. On the other hand, the amount spent by states and the general government for this work at the present time much exceeds one million dollars a year. As late as 1877, immediately following the disastrous invasions of the Rocky Mountain locust into Colorado, Kansas and western Missouri, and which brought about a loss certainly equaling two hundred millions of dollars and reduced a large population to the verge of starvation, it was with the utmost difficulty that Riley and his colleagues were able to secure from congress an appropriation of eighteen thousand dollars to start the United States Entomological Commission on its work of investigation of the causes of the outbreak and the remedies to be used in case of future invasions. A conference of the governors of the various western states and territories asked congress for a commission of five experts and an appropriation of twenty-five thousand dollars, but congress scaled this down to three experts and an appropriation of eighteen thousand dollars. Within very recent years, however, congress has appropriated almost without discussion such large sums as two hundred and fifty thousand dollars for the investigation of the cotton boll weevil and three hundred thousand dollars for the investigation of the gipsy moth and the brown-tail moth, while New Jersey has spent more than a hundred thousand dollars on the mosquito work, and Massachusetts alone more than a million on the gipsy moth, the latter sum covering the work of a number of years. It is safe, in fact, to estimate that there are in the neighborhood of five hundred scientifically trained entomologists holding official positions in this country at the present time, as against five thirty-seven years ago.

That with our rapidly increasing population a certain part of this growth should have occurred would have been quite to be expected, yet no such growth has occurred elsewhere, and we must search for other explanation than the one of normal increase. The first great impetus came with the organization of the state agricultural experiment stations in the spring of 1888 under the act of congress known as the Hatch act. In a short time twenty-eight experiment station entomologists were appointed. It was difficult to find the right men, but Fernald, Comstock and A. J. Cook had been lecturing to slowly increasing numbers of students, and the places were gradually filled and nearly all of them well filled. Most of the appointees found that they had to do much teaching work, and they had to build up libraries and collections, so that there was little time for research work; but there were twenty-eight teachers thrown into the field, for the most part young and enthusiastic men, and through their efforts began a sudden increase in interest in entomology, and year after year their graduates and those of other teachers who had been added to their number have rapidly increased the number of working entomologists and of those possessing a trained interest in the study.

Shortly after these newly appointed experiment station workers took their places and began their labors, the gipsy moth was discovered in New England. It is due to Mrs. Fernald's accurate knowledge of the Lepidoptera that this insect was identified with the destructive European pest as early as it was; and this determination at once made it evident that strenuous efforts must be made to check the spread of the species. The rapid increase of this pest and the remarkable work carried on in the state of Massachusetts during the next ten years attracted the minds of the people of the country towards economic entomology as almost never before.

A few years later the San Jose scale was discovered in the eastern United States. The tremendous effect of the spread of this most injurious species upon the popular estimation of the value of entomological knowledge can hardly be overesti-

mated. This spread alone is responsible probably for more legislation in this country and in other countries than all the other features of entomology combined. The San Jose scale literature published in the last sixteen years covers hundreds of thousands of pages, and hundreds of thousands of dollars have been lost through the work of the insect. But through the operation of new state laws many additional entomologists have been employed, and through their work millions of dollars have been saved.

The discovery in 1894 by Smith, Kilbourne and Salmon that Texas fever in cattle is carried by a tick, the discovery by Ross in 1898 that malaria is carried by certain mosquitoes, the discovery by Reed, Carroll and Lazear in 1900 that yellow fever is carried by a mosquito, and the later numerous discoveries of the role of insects in the carriage of diseases of man and animals have still further intensified public interest in entomology and have shown anew the importance of entomological education. Here economic entomology has touched a new side of human interest; it is the health of man and not the preservation of his property that is concerned, and the interest, therefore, has become a more vital one.

In 1894 the Mexican cotton boll weevil was discovered within the territory of the United States, and its spread to the north and east year after year has presented an enormous problem in economic zoology. The tremendous damage it has done and the fears it has aroused in other cotton-growing countries have threatened a disturbance in the balance of trade for the entire world. The investigation which has been carried on has been liberally supported by the general government, and many trained men have been employed in the work.

The present commanding position which the United States holds in entomology and the wide-spread interest felt in all entomological questions, the increased support of the government in this direction, and the increased attention given to education in economic zoology, are then mainly due to the establishment of the experiment stations, to the advent of the gipsy moth, to the spread of the San Jose scale in the east, to

the discovery of the carriage of disease by insects and to the remarkable and disastrous spread of the cotton boll weevil throughout the south. There are many other causes, such as the recent very great development of interest in the practical handling of the parasites and predatory enemies of injurious species, but these need not be detailed at this time. I have said enough perhaps to explain why there are so many trained entomologists at present and why the agricultural colleges are training so many more; and that brings us to the immediate question of the training of economic zoologists.

In an address on "The State and Zoology" given at Baltimore in December, 1900, I called attention to the fact that university teachers should make a study of the markets for the brains and training of their students; they should study the conditions of those markets and their needs. I showed that the men in charge of university departments of scientific work should keep closely in touch with the government work along similar lines; that they should be encouraged to do so by the government; that the government should employ their services where they can be of use, and that they themselves should be able with the intimate knowledge acquired by official association or by close investigation of government work, to lay out lines of study which will fit their students to take a hand in government work. This, I am glad to say, has been done by several of the teachers of zoology in the agricultural colleges, and by none more successfully than by the Fernalds, of the Massachusetts Agricultural College. The men they have turned out have taken good rank among the experts of the state and government departments. In the bureau of which I am the chief I have secured some of our most valuable workers from this college. Among them I may mention A. F. Burgess, W. E. Hinds, W. A. Hooker, A. W. Morrill, E. A. Back, H. M. Russell, H. P. Wood, J. H. Hyslop, F. H. Jones, F. D. Couden, C. E. Hood, F. A. Johnson, S. S. Crossman, C. W. Hooker and A. I. Bourne; while among the others who have achieved prominence are Dr. E. P. Felt, state entomologist of New York; Mr. A. H. Kirkland, the former sup-

erintendent of the gipsy moth service of the state of Massachusetts; Mr. C. P. Lounsbury, the entomologist of South Africa; Mr. H. A. Ballou, the entomologist of the British West Indies; Mr. R. I. Smith, entomologist of the state of North Carolina; Mr. R. A. Cooley, the entomologist of the state of Montana; Mr. H. C. Gowdey, the entomologist of the African colony of Uganda.

These lists mean an excellent preparation. They mean that the Fernalds have studied the market for the brains of their students, and that they have turned out men fitted in every respect for their pursuit. I have always felt confidence in men coming from this laboratory, and that the work done by this department has been recognized in the erection of this building is a source of gratification to every one connected in any way with the men here or with the men who have gone out from here.

But after all this is only one of the evidences of the spread of education in this direction. Out in California four years ago the university at Berkeley erected a building exclusively for the department of entomology. I visited it only a month ago, and found Professor Woodworth surrounded by his corps of assistants, with the class rooms full of eager students and a general air of bustling energy and interest in the work. At Cornell, where Professor Comstock began, as I have shown, thirty-seven years ago in a small room with no assistants and no equipment, there is now a large department occupying spacious quarters in the new agricultural building erected by the state, with extensive libraries and large collections and a corps of six professors, including Professor Comstock himself. Although the department is still that of entomology and invertebrate zoology, the entomology is by far the most important, and every one of the six professors is teaching entomology. There are also six assistants, of whom four are in biology, one in insect morphology and one in general entomology. The present year there is an enrollment of 565 in the various courses. This includes a registration of 375 in general biology and 190 in purely entomological courses.

In Illinois Professor Forbes has a building devoted entirely to entomology. It is not a very large building, but it is sufficiently commodious and the same interest in the work is shown. In strictly entomological courses this year there are 85 students, of whom 13 are graduate students working in advanced courses. The instructors are—one professor, one assistant professor and two laboratory assistants. Excellent courses are given, and good men are being turned out.

Out in Nebraska Professor Lawrence Bruner started in the autumn of 1888 with three students. During the past year (1909-10) there were 160 students in the first semester and 142 in the second semester in the school of agriculture, while in the college work there were 21 students throughout the year. At the date of present writing there are 23 students registered in college courses, while the school of agriculture has not yet started. Professor Bruner has one assistant professor and a laboratory instructor.

Such information as this might be continued for pages. This is sufficient, however, to indicate the advances that have been made and the sound condition in which we find instruction in economic zoology being carried on at the present time. It may be well to suggest here that if any criticism is to be made of the training that economic zoologists are receiving in our institutions it is that sufficient stress is not laid upon the necessity of learning the methods of field work. A young man coming from a university or an agricultural college knowing his insects well and well fitted to teach, is at a great disadvantage in going into practical work if he has had no field experience, and also if he does not understand agriculture, horticulture and the most important art of meeting and handling men.

It will appear from what has been said that the Massachusetts Agricultural College has borne her full share, and the Massachusetts Agricultural College in this connection means Professor Charles H. Fernald, later with his son Henry. He came here in 1886, just before the founding of the agricultural experiment stations. His published works, both in pure-

ly scientific and economic directions, have stamped him as of the first rank. His work in connection with the magnificent efforts of the state of Massachusetts to control the gipsy moth and the brown-tail moth has been of the soundest character. The affection and respect shown for him by his students is indicated almost daily by those who have come to Washington, and is easily understood by one who, like myself, has been more or less closely associated with him for thirty years. I shall never forget the summer of 1880, when he and Mrs. Fernald spent some time in Washington working with Professor Comstock, who was at that time chief of the Division of Entomology, I myself being his assistant. Professor Fernald was a constant inspiration and he was also a constant delight on account of his overflowing humor. At that time pedlars and mendicants of different kinds were allowed access to the rooms, and it was a standing joke of the Professor's, when the door opened and one of these men came in, to jump to his feet, to appear to recognize him, shake his hand cordially, ask after his wife and children and the old folks at home, which almost invariably so confused the incomer that he turned around abruptly and left the room.

I understand that he is to retire now. I know of no one who has made quite so good a record, viewed from every point. A number of years ago I was riding with him along a country road in eastern Massachusetts, and he said to me, "Howard, I have been thinking about myself and of the little I have done, and I wonder whether after I shall have gone people will think of me as a systematic entomologist or rather as an economic entomologist." And I replied instantly, "You forget probably the biggest work you have done and the best work, and that is as a teacher." And is it not true? The memory of Professor Fernald will live after he goes, both as a systematist and as a strong economic entomologist, but, greater than either, as a teacher; and this building will be a visible monument to his work as long as it shall stand. May he live many more years to know and to enjoy the reputations which are being made and which shall surely continue to be made by the men he has taught.

A new *Argynnis* and a new *Parnassius* (Lep.).

BY HENRY SKINNER, M.D., Philadelphia.

Argynnis sakuntala n. sp.

This is a red fulvous species belonging to the *rhodope*, *serene*, *monticola* group.

In the male the black markings on the upper side of the wings are not as intense a black as in *rhodope* and the red fulvous of the wing is not so deep. The under side of the primaries is marked as in *rhodope* but the ground color is not so intense or dark in color. There is a decided buff space on the secondaries below, between the sub-marginal markings and the row of large spots crossing the wing from the costa to the inner margin. In *rhodope* this space is a dark red fulvous or ferruginous. The spots crossing the wing number seven and they are larger than the corresponding spots in *rhodope* and only edged with black on their inner side. The submarginal crescents are not silvered as in *rhodope*. The basal area is brick red in the form being described and deep red fulvous in *rhodope*. The female is similar but lighter in color. In this sex the submarginal crescents are slightly silvered.

Described from four males and one female.

Habitat.—Ainsworth, B. C., Aug. 13, 1903, Rev. G. H. Findley; Kaslo, B. C., July 7, 1890, J. W. Cockle; Laggan, Alberta, T. E. Bean.

Type Locality.—Kaslo, B. C. The specimens, excepting those from Laggan, were kindly submitted for study by Dr. C. Gordon Hewitt, Dominion Entomologist. The Alberta specimens and the type are in the collection of the Academy of Natural Sciences, of Philadelphia. Owing to the fact that the above mentioned material in conjunction with a large series of *rhodope* has been made available for study, it seems advisable to name this form. What relation it bears to *rhodope* in nature can't be foretold, but it is sufficiently distinct to call attention to it in the hope that future study will establish its true relationship.

Parnassius immaculata n. sp.

Male. Expands 1.25 inches. Primaries marked as in *Parnassius clodius*. Secondaries devoid of spots, the only marking is formed by the black scales on the inner margin and on the inner side of the discoidal area.

Described from one specimen taken at the Old Faithful Geyser, Yellowstone Park, Wyoming, by Mr. W. Judson Coxey, and kindly presented by him to the Academy of Natural Sciences, of Philadelphia. What relation this bears to *clodius* I am not prepared to say. Additional material and study in its habitat will be necessary to solve the problem.

Two new Gall Midges (Dipt.).

By E. P. FELT, Albany, N. Y.

The two West Indian species described below were reared by Mr. W. H. Patterson, of the School of Agriculture, St. Vincent, and recently sent to the writer for determination.

Asphondylia vincenti n. sp.

This species was reared from the fruits of *Jussiaea linifolia* and *J. suffrutiosa*, at St. Vincent, W. I.

Male. Length 1.75 mm. Antennae nearly as long as the body, sparsely short-haired, dark brown; 14 sessile segments, the fifth with a length about five times its diameter; circumfili distinct, very tortuous. Palpi: first segment irregularly oval, with a length over twice its diameter, the second slender, nearly three times the length of the first. Mesonotum a nearly uniform slaty brown, the submedian lines sparsely haired. Scutellum fuscous yellowish, postscutellum darker. Abdomen sparsely haired dark brown. Wings hyaline, costa light brown, subcosta uniting therewith just before the basal half, the third vein at the apex of the wing, the fifth just beyond the distal third, its branch just before the basal half. Legs mostly a variable fuscous yellowish, the tarsal segments being darker, except the yellowish brown tibiae and first four tarsal segments of the posterior legs; simple claws rather slender, strongly curved, the pulvilli as long as the claws. Genitalia; basal clasp segment short, greatly swollen; terminal clasp segment short, swollen, bidentate apically; dorsal plate divided, the lobes narrowly oval and thickly setose apically; ventral plate small, apparently bilobed.

Female. Length 2 mm. Color characters nearly as in the male. Antennae: the fifth segment with a length about five times its diameter, the 12th with a length $\frac{1}{4}$ greater than its diameter, the 13th a little shorter, the 14th flattened, subglobose. Palpi: the first segment with a length nearly three times its diameter, the second slender, $\frac{1}{2}$ longer; posterior tibiae and first four tarsal segments markedly lighter than in the male. Ovipositor when extended about as long as the body, the acicula slender, acute; dorsal pouch moderate sized, the lobes thickly setose and narrowly rounded apically.

Pupa. Length 2 mm. Oval, stout, yellowish brown; cephalic horns moderately long, stout, the inner oblique margins finely serrate; antennal cases extending to the first abdominal segment, the wing cases to the fourth and the leg cases to the sixth. Just below the base of the antennae and on the venter there is a median, triangular, chitinous pro-

cess. and a little behind that a bidentate, chitinous process with a minute median tooth. Pupal skin thickly set with chitinous points or corrugations. Abdominal segments each with the dorsum ornamented with two sparse, transverse rows of stout spines, these becoming irregular on the terminal segment, the apex being marked with a group of two or three divergent, sublateral spines.

Larva. Length 2 mm. Rather stout, white, distinctly segmented; head extremely broad, only the tips of the slightly protuberant mouthparts being fuscous; antennae short, extremely minute, the whole greatly obscured by the large, strongly chitinized breastbone, which latter is broad, anteriorly, quadridentate, being divided by a median incision into two groups of minor teeth; shaft rather indistinctly chitinized and supported by submedian, chitinous, rounded lobes; skin coarsely shagreened.

Type Cecid 22118, N. Y. State Museum.

Hyperdiplosis eupatorii n. sp.

This species was reared from a green, conical gall with a length of about 4 mm. and a diameter of 1.5 mm., on the upper surface of the leaves of *Eupatorium*, the insects pupating within the deformity. This form is provisionally referred to *Hyperdiplosis*, because it agrees therewith in the triarticulate palpi, the reduced circumfili and the deeply and roundly excavated ventral plate. The antennal stems of the typical *Hyperdiplosis* are more produced and the claws more strongly bent than in this West Indian form.

Male. Length 1.1 mm. Antennae $\frac{1}{2}$ longer than the body, thickly haired, fuscous yellowish; 14 segments, the fifth having the basal portion of the stem with a length $\frac{1}{2}$ greater than its diameter, the distal part with a length $2\frac{1}{2}$ times its diameter; basal enlargement subglobose, a sparse subbasal whorl and a subapical circumfilum, the loops short and reaching only to the middle of the stem; the distal enlargement with a length $\frac{1}{2}$ greater than its diameter, a scattering whorl of setae, subbasal and subapical circumfili, the loops of each short, those of the distal filum not extending to the tip of the segment; terminal segment having the distal enlargement subcylindric, with a length $2\frac{1}{2}$ times its diameter and a stout, finger-like process apically. Palpi; first segment short, irregular, the second with a length three times its width, the third nearly twice the length of the second, more slender. Mesonotum light brownish red, the yellowish submedian lines sparsely haired. Scutellum and postscutellum yellowish. Abdomen yellowish red, the fifth to seventh segments yellowish; genitalia reddish. Wings hyaline,

costa light brown, subcosta uniting therewith near the basal third, the third vein well beyond the apex, the fifth just before the distal fourth, its branch near the basal half. Halteres whitish transparent. Legs a nearly uniform fuscous yellowish, the simple claws slender, slightly curved, the pulvilli shorter than the claws. Genitalia; basal clasp segment long, stout; terminal clasp segment rather long, stout, irregularly curved; dorsal plate broad, broadly and roundly emarginate, the lobes irregularly rounded, sparsely setose; ventral plate long, broad, broadly and very deeply emarginate, the lateral angles rather stout, finger-like, setose apically; style long, stout, broadly rounded distally.

Female. Length 1.5 mm. Antennae nearly as long as the body, sparsely haired, dark fuscous; probably 14 segments, the fifth with a stem 1-3 the length of the cylindric basal enlargement, which latter has a length about three times its diameter. Palpi: first segment rather stout, with a length twice its width, the second a little longer, more slender, the third $\frac{1}{4}$ longer than the second. Coloration nearly as in the male, except that the abdomen appears to be deep red. Ovipositor short, stout, when extended with a length only about 1-3 that of the abdomen; terminal lobes narrowly elliptical, with a length three times the width, rather thickly and coarsely setose.

Pupa. Length 2.75 mm. Yellowish white; cephalic horns stout, yellowish brown; thorax with a yellowish cast, thoracic horns rather stout, curved; antennal cases extending to the first abdominal segment, wing cases to the third abdominal segment, the leg cases to the sixth; abdomen whitish, each of the segments dorsally with a short, transverse row of two to five stout, chitinous spines, the posterior extremity apparently unarmed.

Type Cecid a2116, N. Y. State Museum.

TIMETES.—In rearranging the American Rhopalocera in the collection of the Academy of Natural Sciences of Philadelphia recently, I became interested to know whether one or two of the red species of *Timetes* were found in the United States. I found that we only had one authentic specimen from the United States and it was taken by Mrs. Slosson at Biscayne Bay, Florida. This specimen proves to be *T. peleus* Sulz. (*petreus* Cramer). The other species in our lists is *eleuthea* Hubn, and it is said to have been taken in Texas and Florida. It is a species found in Cuba and would be likely to be also found in Florida. It is not recorded from Mexico as far as I am aware. *Peleus* and *eleuthea* are closely related and it is likely that the two have been confused. Exact records for these insects are desirable as well as exact identifications so that we may determine whether we are to list both species or only one. I will be pleased to identify any material and would also be glad to have exact data of correctly determined specimens.—HENRY SKINNER..

Notes on *Tyloderma foveolatum* (Say) (Col.).

By A. A. GIRAULT, Urbana, Illinois.

On June 1, 1909, at Centralia, Illinois, along a fence around a meadow on a farm there were found in a tangle of weeds an occasional clump of evening primrose (*Oenothera biennis* L.), every plant in which had been attacked by this common weevil. Eggs were then very abundant; thus on a random plant sixty-seven egg-scars were counted. The eggs have the following characters:

Length, 0.80 mm.; width, 0.65 mm. Short-oval to oval; surface covered with a greyish, deciduous substance not unlike a coating of thin sugar and which is opaque and without sculpture. When this is rubbed off, the surface of the egg is polished yellow, with no marked sculpture but slightly coriaceous or like the surface of some leathers. Soft, pliable, easily crushed. Inconspicuous. General color greyish yellow; when seen in its natural position, the upper side (and also the lower) is slightly flattened. Deposited singly. When examined with transmitted light, the egg is liquid yellow or amber, opaque centrally; this color persists until hatching. The pruinose coating is easily removed by gently rolling the eggs between the fingers. The micropyle is not conspicuous.

Several females were observed laying eggs; the manner of doing this is extremely interesting. In the cases observed the males were not present. The mother weevil faces toward the top of the plant and takes a firm hold. She then proceeds to eat out of the stem of the plant a quadrate or oval cavity, making it about a half of a millimeter deep. When this is completed, she turns about, fits the end of the abdomen into the cavity and places an egg. Then assuming her former position by turning about, she advances, breaks the skin of the plant with her beak and peels a short strip of it down to the cavity and tucks it over the egg; this is repeated a number of times. Then she commences to peel off in the same manner longer strips from above and to one side of the cavity; these longer strips are peeled down as far as the bottom end of the egg cavity, bent over it and packed with the beak around the egg. Finally, she turns about, after crossing over the nidus,

and commences to peel the long strips from the opposite direction, pulling them up as far as the top of the cavity, bending them back over it and packing them in and around the egg as formerly. In this manner, at the end, she has the egg securely protected by a closely kneaded and interwoven network of plant tissue which becomes conspicuous by being in the center (axially) of a well-defined, denuded area and also because it is convex. The whole operation may require from forty-five to seventy-five minutes, or perhaps on the average about an hour. This method of protecting the egg is certainly ingenious.

The following general notes were recorded: On June 20, 1909, females were still laying eggs. To show the comparatively enormous number of these which a single plant may receive, two random plants were examined on this date. In the case of the first, the main stem bore 204 egg-scars and three branches, 22, 13 and 28 respectively, a total of 267. The main stem of the second plant bore 97 egg-scars and its three branches, 7, 7 and 4 respectively, or a total of 115. This means in the case of the main stem that not many areas occur which are not entirely covered with the nidi. Most of those occurring on the branches faced inward or toward the main stem.

June 28, a female accompanied by its mate, riding upon its back, was observed making an egg-cavity and also a similar pair was observed at the same time engaged in completing a nidus after deposition; the males were passive in both instances. By this date, the adults were less common, the eggs, however, still commonly found in the plants; the larvae were more common, perhaps, than the eggs.

Two weeks later (July 15), adults were still present, engaged in oviposition, though noticeably less abundant. The majority of plants now opened for examination have their pithy interiors, especially near the ground, hollowed out and filled with brownish frass and debris, like moist ground cloves, those larvae which are full-grown at this time (6.25 mm.) being buried within the pith and partly concealed by the frass. Far-

ther up the stem, the hollowed-out channel gradually narrows, widening occasionally for some older larva (we may infer that first oviposition is done near the surface of the ground, later the eggs placed higher up on the stems), so that half way up the stem of the plant, merely the narrow, oblique channels of the smaller larvae are usually present at this time, none of which lead directly from the nidus to the pithy center of the stem but instead are more or less diagonal and curved, sometimes irregular or tortuous. No pupae have been found as yet. The larvae were, of course, in various stages of development.

On August 7, a badly infested plant taken from the field and examined contained full-grown larvae and also pupae. No adults have been noticed since the fifteenth of July. No other notes were obtained.

It is easily inferred that but a single generation of this weevil occurs during a season, the adults emerging in the late summer and early autumn and without attempting reproduction, hibernate. The next spring, they feed and mate, then continue to lay eggs for about two months, and in course of about a month and a half after the first eggs the adults may commence to emerge, continuing for a month or so. At Butler, Ill., eggs were found on July 16, 1910. Larvae, then, were in all stages of development. Mr. E. A. Schwarz, U. S. N. M., kindly authoritatively identified the specimens.

A NOTE ON *CHLAMYS PLICATA* FABRICIUS.—This peculiar chrysomelid was abundant on wild blackberry plants at Centralia, Ill., during 1909. These notes were made concerning it: Larvae present during June; first pupa found in the larval case attached to the stem of a weed, two feet up from the ground, on June 28. The first beetle emerged from pupae kept in confinement but collected outdoors, on July 7 to 9. On July 19, 1909, 10 beetles which emerged a week and a half earlier were transferred to a breeding-cage containing fresh foliage of blackberry; although they lived for at least a month, they did not reproduce. They had been well attended to as regards food.—A. A. GIRAULT, Urbana, Ill.

New American Cleridae, with notes on others (Col.).

By A. B. WOLCOTT, Chicago, Ill.

The material forming the basis of the present article was recently received from Prof. H. F. Wickham, by whom it was collected and to whom my thanks are due for having generously placed in my hands for study all his unique and most valued specimens. Nearly all the species herein described as new are forms differing greatly from their nearest allies and should prove of easy recognition.

CALLOTILLUS gen. nov.

Body elongate, moderately convex, winged. Labrum short, transverse, truncate; eyes small, finely granulate, internally deeply emarginate; last joint of maxillary palpi subcylindrical, of labial palpi securiform; antennae 10-jointed, joint one moderately large; joint two small, suborbicular; joint three elongate, triangular, longer than joint one; joints four to nine triangular, much larger than preceding joints, as broad as long; joint ten compressed, longer than the two preceding joints together, obtusely rounded at apex.

The species for which this genus is erected is *Clerus*-like in form. The structure of the antennae recalls both that of *Tillus* and *Monophylla*. The third joint of the antennae is elongate triangular, but much narrower and more elongate than the succeeding joints. The legs are slender and moderately long. The tarsi, five joints of which are visible from above, are scarcely one-half as long as the tibiae; they are feebly dilated and joints two, three and four are lamellate; the claws are bifid, the inner division slightly shorter than the outer portion and furnished with a strong tooth at base. Five segments of abdomen visible.

The structure of the tarsi and the antennae bring this genus into the group Tillini, where it is best placed between *Monophylla* Spin. and *Tillus* Oliv.

Type of the genus is the following new species:

Callotillus eburneocinctus sp. nov.

Rufous, subopaque; meso- and metasternum rufo-piceous; abdomen black, shining, posterior margins of ventral segments pale; antennae

pale testaceous; elytra with a narrow, slightly recurved, elevated, median fascia pale yellowish, apical half of elytra blue black. Head including the feebly prominent eyes not wider than the thorax at apex, moderately clothed with whitish pubescence, rather finely very densely punctate. Thorax longer than broad, much narrower at base than at apex, apical margin arcuate, sides broadly rounded to behind the middle, thence gradually convergent to base, less densely but a little more coarsely punctured than the head, clothed with short, recumbent, grayish pubescence, and in apical half, with long erect black pilosity which



Right antenna of *Callotillus eburneocinctus* n. sp.

is dense each side of middle, forming a large indefinitely limited rounded spot. Elytra broader at base than the thorax at widest part, sides parallel in basal half, behind this arcuately broadened then narrowed to the conjointly rounded apices, humeri moderately prominent, each elytron strongly tuberculate at base midway between scutellum and humerus, the tubercles clothed with erect black pilosity, basal half of elytra rufous, clothed with sparse black pilosity, finely densely punctate, apical half blue black, densely clothed with short grey pubescence with some longer erect black hairs intermixed, as densely but more coarsely punctate than basal half, a narrow, slightly elevated somewhat recurved, pale yellow median fascia attains the flanks but not the suture. Body beneath and abdomen sparsely, finely punctate, clothed with sparse whitish pubescence. Legs moderately clothed with whitish hairs. Length 5 mm.

One specimen. Key West, Florida. Type in collection of Prof. Wickham.

Cymatodera delicatula Fall, Canad. Ent., xxxviii, 1906, p. 113.

A specimen taken at Tepehuanes, Durango, Mex., I refer to this species with slight doubt. It differs in no discernible structural character from the typical form from Lower California. The color in the example before me is, however, so different from that of the Lower Californian form that no doubt they would be considered distinct were specimens of the species from the type locality not before me.

In the Tepehuanes specimen the body beneath is pale testaceous, the head entirely black, the thorax as in the type, but

the elytra are black with a much narrower ante-median fascia, which is slightly interrupted at the suture; the apices of elytra not pale. The specimen is 3.5 mm. in length.

Cymatodera turbata Horn, Trans. Amer. Ent. Soc., xii, 1885, p. 151.

This species was also taken at Tepehuanes, Mex., by Prof. Wickham. The specimen is typical in every respect with the exception of a very slight infusate cloud at extreme apices of elytra. This species has not been recorded as occurring elsewhere than in Texas, if we exclude a Panama record of a species doubtfully determined as *turbata*.

Cymatodera comans Wolc., Publ. Field Mus. Chicago, vii, 1910, p. 351, pl. 6, f. 14-16.

Two male specimens of this species have been sent me by Prof. Wickham since the description was published. Both examples were taken at Salton, Cal., August 20, and form an interesting record as they were found at 265 feet below sea level. A female from Peach Springs, Ariz. (Wickham), is considerably smaller than the type, being but 7.5 mm. in length. A male from Yerington, Nev. (Baumberger), is of the same size as the female from Peach Springs. The present known distribution of the species is Utah, Texas, Arizona, California and Nevada.

Cymatodera bipunctata Gorh., Biol. Centr.-Ameri., Col. III, 2, 1882, p. 135, pl. vii, f. 16.

A specimen of this very rare species labeled "Jalapa, Mex.," was sent me by Prof. Wickham. The species was originally described from Oaxaca, Mexico, two specimens being all that were known.

The specimen at hand agrees in every way with the description with the exception that the sutural margins from the middle to apex are very narrowly bordered with black. The structure of the antennae is as in *inornata*, but the outer joints are even less dentate. The specimen is a female, hence the terminal segments of the abdomen furnish no characters of importance. The length of the specimen is 9.5 mm.

ENOCLERUS

Gahan, Ann. Mag. Nat. Hist. (8), v, 1910, p. 62 and 65. *Clerus* Schklg., Gen. Ins., Cleridae, 1903, p. 48 (nec. Fabr.).

The term *Enoclerus* proposed by Prof. Chas. J. Gahan for the American species formerly placed in *Clerus* is suppressed by Sigm. Schenkling in the Coleopterorum Catalogus (W. Junk), Cleridae, 1910, p. 51, and placed as a synonym of *Clerus* Fabr.

Prof. Gahan has, I think, plainly demonstrated that the type of the genus *Clerus* is the European *mutillarius* Fabr., a species not congeneric with the American species. Prof. Gahan used both the "first species" and "elimination" methods and both gave the same result. *Sexguttatus* Fabr., which must be accepted as the type of *Clerus*, if the classification of Mr. Schenkling be approved, was not included as one of the original species, apparently being unknown to Fabricius at the time he characterized the genus, the description of *sexguttatus* appearing in an appendix to the volume. *Mutillarius* was the last of the species originally included in *Clerus* by Fabricius to be removed to another genus. Jacques du Val in 1861 made it the type of his genus *Pseudoclerops*. Therefore there seems to be no other course than to consider *Pseudoclerops* a synonym of *Clerus* Fabr., and to retain the name *Enoclerus* for the American species.

Enoclerus ocreatus Horn, Trans. Amer. Ent. Soc., xii, 1885, p. 154.

Specimens of this species occur in Colorado in which the antennae and tibiae are quite dark; these specimens bear a great deal of resemblance to an immaculate *humeralis* Schaeff., but the elytra are slightly more depressed and the punctuation much less inclined to become seriate.

Enoclerus humeralis Schaeff., Sci. Bull. Brooklyn Inst. Mus., I, 1905, p. 155.

This species originally described from Tulare Co., California, appears to be confined to the Pacific coast region. In the collection of Mr. F. S. Daggett there is an example from San Bernardino Mts., California, elevation 6,400 ft. My friend, Mr. F. W. Nunenmacher, has recently sent me a specimen

from Del Norte Co., northern California, and from Prof. Wickham I have received a specimen for identification which is labeled Vernon, B. C. In all these, as in the type, the red humeral markings are strongly limited and of the same form.

Enoclerus quadriguttatus var. *rufiventris* Spin., Mon. Clér., I, 1844, p. 264, pl. xxiii, f. 3.

A specimen of this variety from Mt. Katahdin, Maine, 5,000 feet, sent for examination by Prof. Wickham has the usual coloration of this variety excepting that the apical margin of the prothorax is dull testaceous and the median elytral fascia is bright orange-yellow; a subapical fascia of the same color is less evident, being more thoroughly hidden by the dense grayish pubescence clothing this part.

Enoclerus bombycinus Chevr., Col. Mex., cent. I, fasc. 1, 1833, No. 42.

Three specimens from Tepehuanes, Durango, Mexico, sent by Prof. Wickham, are as variable in size as the examples from eastern Mexico, but remarkably constant in coloration.

Enoclerus spinolae Lec., Proc. Acad. Nat. Sci., Philad., vi, 1853, p. 230.

A specimen of this species taken by Prof. Wickham at Tepehuanes, Durango, Mexico, has the post median fascia nearly complete, the interruption at the suture being very narrow.

This species has on two or more occasions been recorded as occurring in Mexico, but no definite locality has been given.

Enoclerus acerbus sp. nov.

Closely allied to *ichneumoneus* Fabr., from which it differs as follows: Form broader and depressed, head and prothorax rather coarsely rugose, elytra very finely confluent punctate, the general color black, a broad median fascia and the abdomen yellow. Head, prothorax, base of elytra and legs clothed with long erect and semi-erect greyish hairs; these are wanting upon the disk of the prothorax where they are replaced by very short, dense black pubescence and longer black hairs. Elytra black, a broad median fascia yellow, the anterior and posterior margins of fascia sub-parallel but arcuate upon each elytron, the convexity being toward the base of elytra, a sub-apical oblique fascia composed of short greyish pubescence as in *ichneumoneus*,

the black portions clothed with short velvety black pubescence, and with the fascia with sparse long black hairs. Length 10 mm.

Elko, Nevada. Type in cabinet of Prof. Wickham.

A smaller specimen (8.2 mm.) which is not before me at the present time is in the collection of the Illinois State Laboratory of Natural History. This specimen is from the "Peabody colln." and bears the locality label "Ut." and the name label *analis*, from which it is entirely distinct.

Enoclerus opifex Gorh., Biol. Centr.-Amer., Col., iii, 2, 1882, p. 156, pl. viii, f. 3.

Two specimens of this interesting addition to our fauna were taken at Alpine, Texas (4400-6000 ft.) by Prof. Wickham. Gorham described *opifex* from Mexico, Guatemala and Nicaragua. It is quite unlike any other species in our fauna. The color is black, shining, the elytra red, a large rounded subapical black maculation on each elytron sometimes confluent at suture, the black bordered anteriorly by a narrow pale red fascia, the extreme apex is black and with the legs is densely clothed with gray hairs. The specimens before me are 7.5-8 mm. in length. Gorham gives the length of this species as 5.5-8 mm.

Enoclerus analis Lec., Ann. Lyc. Nat. Hist. N. Y., v, 1849, p. 20.

This appears to be a much misunderstood species, others than the proper species usually bearing this name in collections, while *analis* is as often placed under another name. I have even found them placed as *abruptus*, a species to which they bear but little resemblance. *Analisis* is variable in regard to the coloration of the legs and abdomen, the elytra are on the contrary quite constant, being in all specimens examined red at base and dark before the median fascia which has a form not found in any other species occurring in North America, and which is somewhat similar to that of *rosmarus* but more deeply and regularly concave and greatly prolonged posteriorly at the suture, reaching nearly, or quite to the subapical fascia; the apex is black (pale in most specimens of *rosmarus*) and the black space intervening between the pale

fasciæ is much wider than in *rosmaris*. The legs are usually black, but the color varies to the extent of all the tibiæ red and in some individuals the anterior and sometimes a portion of all the femora as well as the tarsi are also red. The color of the abdomen as given in the original description and as given in the notes subjoined is contradictory, but as due to actual variation in color the statements are true; the abdomen varying from entirely pale red, the apical segment sanguineous red, to entirely black, usually, however, with the apical segment red. The specimens at hand show that the basal segments are the first to become darker, these having at times merely an infuscate cloud; the most common form has the three apical segments red.

***Enoclerus abruptus* Lec.**, Proc. Acad. Nat. Sci., Philad., 1858, p. 72.

This is undoubtedly the most variable species of the genus. The typical form has the head, thorax and legs red, but forms are at hand with the same parts black; in other specimens the head and thorax may be black, the legs red or again these conditions may be reversed. The basal maculations of the elytra are always present, but in some individuals they are but little paler than the basal portion of the elytra; the width and form of the median fascia is very variable, and is usually but not always interrupted at the suture. The color of the pale parts varies from red to yellow. It is probable that two or more of the species now standing as valid are but varieties of this species.

***Enoclerus abruptus* var. *coccineus* Schklg.**

Clerus coccineus Schklg., Deutsch. Ent. Zeitschr., 1906, p. 272.
pl. II, f. 7.

Clerus corallinus Fall. Trans. Amer. Ent. Soc., XXXIII, 1907,
p. 240.

This is one of the many forms deserving of a varietal name. *Coccineus* was described from northern Mexico but occurs in our fauna from Duluth, Minn., through Nebraska and Colorado to Texas and New Mexico.

Enoclerus palmii Schaeff., Journ. N. Y. Ent. Soc., xi, 1904, p. 218.

This recently described species seems to be not rare in collections. It is in my collection from Las Vegas, New Mex., and Prof. Wickham has taken it at Gallup, New Mex., and at Williams, Ariz. There is some variation in size but the markings and sculpture are constant.

Hydnocera superba sp. nov.

Moderately robust, cyaneous, shining; head and thorax with slight greenish tint, the latter sometimes æneous; elytra violaceous; antennæ pale testaceous at base, gradually infuscated toward apex; legs blue black. Head including the eyes wider than the prothorax, very densely but not very coarsely punctate, front impressed each side of middle, clothed with short sparse whitish pubescence, with a few long erect black hairs intermixed. Thorax broader than long, densely, rather coarsely punctate, middle of disk at base impunctate; sides strongly constricted at apex, moderately dilated at middle and straight and parallel at base, lateral foveæ deep and distinct, pubescence greyish, short sparse and inconspicuous with a few long erect black hairs intermixed. Elytra normally covering the abdomen, feebly narrowing to apex; humeri distinct; surface coarsely, subcristately punctate, the individual punctures mostly well separated, apical two-fifths more finely and densely punctate, becoming scabrous toward apex; apices obtusely separately rounded, non-serrate, slightly dehiscent at suture; clothed with short, recumbent greyish pubescence which is most conspicuous toward the apices and also forms an indistinct fascia at apical two-fifths, also with longer dark hairs which are erect before the fascia and semi-recumbent behind it. Body, abdomen and legs very finely and densely punctate, moderately clothed with whitish pubescence, the legs quite densely. Length 6 mm.

Two specimens. Tepehuanes, Durango, Mexico.

Type in collection of Prof. Wickham; cotype in my collection.

Hydnocera mexicana sp. nov.

Robust, æneous, moderately shining; antennæ (except club), tibiae and tarsi rufo-testaceous, the tarsi more or less infuscate; abdomen black with cupreous reflexions. Head, including the eyes, distinctly wider than the prothorax, rather coarsely, very densely punctate, clothed with short, whitish, recumbent pubescence and longer sparse black pilosity. Thorax wider than long, discal area sparsely, the flanks coarsely and densely punctate; sides strongly dilated before the middle, strongly constricted near apex, feebly convergent at base; lateral

foveæ moderately distinct; pubescence and pilosity similar to that of head but more dense. Elytra scarcely shorter than the abdomen; flanks slightly convergent posteriorly; wider than the head; humeri distinct; disk feebly convex; coarsely, densely punctate, an area behind the post-median fascia confluent punctate, becoming granular at the apices; sparsely clothed with short, recumbent, whitish hairs, long erect black hairs conspicuous on basal half; a post-median transverse spot or fascia dull testaceous, clothed with long, recumbent, posteriorly directed whitish hairs, these also extending anteriorly on suture to about basal one-third, thence sinuately to the humeri, behind the fascia these hairs also evident, extending nearly half way to apices thence forming an arcuate fascia with its convexity toward the apices, the latter obtusely, separately rounded, non-serrate and dehiscent at suture. Body beneath and abdomen finely, sparsely punctate, clothed with moderately long, sparse hairs; legs clothed with short whitish and longer erect black hairs. Length 5.—5.5 mm.

This species bears a striking resemblance to the North American *subfasciata*, the size, color, general form and especially the markings being very similar. The upper surface more coarsely punctate throughout, the more distinctly marked elytral pattern with the post-median color fascia and non-serrate elytral apices render it impossible to consider it as other than a distinct species.

Two specimens. Tepehuanes, Durango, Mexico. Type in collection of Prof. Wickham; cotype in my collection.

Hydnocera bituberculata Chevr., Rev. Mag. Zool., 1874, p. 71.

A specimen of this graceful but oddly formed little species was taken at Jalapa, Mex., and sent me by Prof. Wickham. In the original description the color of elytra is given (by implication) as black, while in the *Var. B.* the prothorax and elytra are said to be blue. In the present specimen the head and prothorax are shining dark bluish green and the elytra are purplish black. The length is 4 millimeters, agreeing with the type in size. The basal tubercles of the elytra are quite conspicuous.

Ellipotoma laticornis Say.

Enoplum laticornis Say, Bost. Journ. Nat. Hist., I, 1835, p. 164.

Ellipotoma laticornis Wolc., Bull. Ind. Dep. Geol. Nat. Res., I, 1910, p. 859.

This species, which I have referred to the genus *Ellipotoma* Spinola, has the antennæ eight-jointed in the male, while in the female they are ten-jointed. *Ellipotoma* (*Apolopha*) *trilineata* Chevr. (Rev. Mag. Zool., 1874, p. 324) is very doubtfully distinct from *laticornis*. Our species is in any event better placed in *Ellipotoma* than in either *Apolopha* or *Ichnea*, I agree with the expressed view of Prof. Gahan that *Ellipotoma* should be removed from the group Hydnocerini and be placed near *Phylloboenus* in the group Enopliini of the subfamily Corynetinæ.

***Eurycranus pulchellus* sp. nov.**

Elongate, bluish-green, shining; abdomen, femora and pronotum dark aeneous green, apical margin of the latter dark violaceous; eyes, antennæ, parts of the mouth (labrum, mandibles, palpi), tibiæ and tarsi black; prosternum and apical half of prothoracic flanks rufous; elytra brilliant green with slight metallic lustre and very shining. Head not wider than prothorax at apex, rather finely and densely punctate; eyes feebly convex; front biimpressed; clothed with short, sparse, whitish pubescence and long, moderately dense erect black pilosity; antennæ shorter than the head and thorax. Thorax distinctly wider than long, widest at basal third, base and apex sub-equal in width, subapical constriction feeble; sides broadly rounded; subapical transverse impressed line feeble; basal impressed line deep; a feeble fovea each side at middle; disk at middle longitudinally sulcate; surface coriaceous, rather coarsely and irregularly punctate; clothed with very sparse, recumbent whitish pubescence and long erect black pilosity. Elytra subparallel; apices conjointly rounded; rather strongly convex; humeri protuberant; a distinct post-humeral fovea; scutellar region depressed; coarsely, densely irregularly punctate at base, the sculpture becoming scabrous toward apex; entire lateral margin and apical two-thirds of sutural margin bicarinate; rather densely clothed with long, semi-recumbent, coarse, yellowish white pubescence with longer, erect black hairs intermixed. Body beneath moderately coarsely, sparsely punctate; legs finely, densely punctate. Venter and legs moderately clothed with yellowish white pubescence. Length 6 mm.

This is the second species of the genus to be made known from elsewhere than Chili, which country is the metropolis of the genus *Eurycranus*. Rev. Mr. Gorham (Biol. Centr.-Amer., Col. III, 2, p. 165) described a species from Guatemala, to which he gave the name *viridiaeneus*. The present

species differs from Gorham's species by having the prothorax broader than long (longer than wide in *viridiaeneus*); the mouth, antennæ and palpi black and the legs dark (these parts red in *viridiaeneus*) and the sculpture of the thorax and elytra is quite different.

One specimen. San Angel, D. F., Mexico.

Type in collection of Prof. Wickham.

PRIONOSTICHAEUS nom. nov.

The above term is here proposed to replace the generic name *Prionodera* Wolc., (Publ. Field Mus., Chicago, VII, 1910, p. 396) which I find is a homonym of *Prionodera* Chev. (Dej. Cat. Col., 2nd ed., 1834), a genus of Chrysomelidae.

Three new Brazilian Micro-Lepidoptera.

By W. D. KEARFOTT, Montclair, N. J.

Anacrusis iheringi sp. n.

Exp. ♂ 25-26 mm., ♀ 28-30 mm.

Head and collar dark chocolate brown, mixed with black; face and palpi pale clay-yellow, speckled with dark brown; antennae clay-yellow, dark brown above; thorax, abdomen and legs, light clay-yellow.

Forewing ♂, pale clay-yellow, transversely finely strigulated with a darker shade, the strigulations forming faint costal dashes. On the outer half of wing, above middle is a long horizontal chocolate brown triangular streak, beginning at end of cell, its upper edge nearly reaches apex, but bends acutely downward toward middle of termen, the lower edge is broadly concave and below it is a cloud of brownish scales. This brown mark is bordered anteriorly by a broad and outwardly by a narrow silver white edging. In some specimens there is a tendency of the brown mark to become broken near its inner end. In the apex is a small white spot transversed by a narrow chocolate brown line. Cilia clay-yellow.

Hindwings light clay-yellow, with a few brown flecks in apex.

The ♀ is generally darker than the male. The triangular mark on forewing is replaced by a dot of brown at end of cell in middle of wing and half way between this dot and apex is a silvery white round spot, enclosing on its inner side a lunate spot of chocolate brown. Between these and reaching to costa the ground color is much darker, forming a quadrate costal spot.

The ♀ forewing is strongly incised between apex and middle of termen and below middle is strongly concave, in the ♂ the upper incision is much slighter and the lower half of termen is convex.

Described from one ♂ and two ♀'s from Sao Paulo, Brazil, from Dr. R. von Ihering, of the Museo Paulista, for whom the species is named (No. 10-650). Types in my collection.

Stenoma chlorina sp. n.

Exp. 24-27 mm.

Head sordid yellowish brown, face hoary white, palpi dark bronzy green with scattered white scales on upper side of both 2nd and 3rd joints; thorax light gray; abdomen light yellow, anal tuft ochreous; legs, ochreous, tarsi ringed with dark brown.

Forewing of a shining chlorina-green, the ♂ in certain lights and from certain angles, a lighter, whitish shade is visible, especially between upper edge of cell and costa, at end of cell and in a narrow terminal line. In the ♀ this white shade is permanent and parallels costa from extreme base to middle of termen; it is interrupted at middle of costa and sends a narrow curved spur to the dot at end of cell, and thence to hindmargin; it is somewhat speckled through its length by ground color; in the ♀ the terminal whitish line is much more distinct.

There is a dark brown, almost black, spot on the fold at two-fifths of wing length from base; at the end of cell is a more intense dot of the ground color, surrounded by whitish scales.

Hindwing dull ochreous brown, cilia clear yellow.

Described from six specimens from Dr. R. von Ihering, Sao Paulo, Brazil (No. 10-860); two in Meyrick's collection.

The forewings of this species are broader than the *schlaegeri* group, and more nearly the shape of *sciaphilina* Z.

Stenoma dissimilis sp. n.

Exp. ♂ 17-22 mm., ♀ 23-27 mm.

Head white, suffused with lavender gray in front, face white; palpi white, with an ochreous brown spot, above, at base of 2nd joint, a suffusion of the same shade in the middle of the terminal joint; thorax gray; abdomen whitish yellow.

Forewing, ground color, pure white; the lower half of wing bounded by fold is gray, with a pinkish-lavender suffusion, its upper edge is bordered above by four quadrate spots of a darker degree of the same shade, the dorsal margin from base to middle of this patch is dull gray;

between the outer end of patch and tornus are two flatly triangular indian red spots; from the outward one arises a curved transverse line of six gray dots, paralleling the termen. Above the patch, and connecting it to the costa, at inner sixth, is a broad fascia of light brown, containing a dark brown streak at its lower edge and inner side of the upper half.

The costa is washed with pale yellow, and there are small shades of this color and gray, between costa and dorsal patch, the most prominent is a yellowish gray spot at end of cell, near costa, below it a smaller and fainter spot, and beyond the latter is a curved mark of light gray. Between the row of sub-terminal dots and termen is a curved shade of yellowish gray.

Hindwing white, inwardly shading into ochreous-white.

♀ differs from male in the dorsal patch, which is heavily overlaid with blackish brown, especially on the outer half. The shades of ochreous, red and lavender are also entirely absent.

Described from seven ♂'s and five ♀'s from Dr. R. von Ihering, Sao Paulo, Brazil (No. 10-631).

This species belongs to the *schlaegeri* group, with narrow forewing. In the ♂ there is a distinct narrow dorsal fold or roll, and in this sex the scales of the basal patch are long and specialized.

A pair in Dr. Edward Meyrick's collection, and I gratefully acknowledge his kindness in comparing this and preceding species with British Museum collections.



COURTSHIP IN TARANTULAS.—The instincts of the male tarantula change suddenly at the period of maturity. From a creature with domestic habits he develops into a vagabond. Disregarding personal danger he constructs a sperm-web into which he throws out his sperm and pumps it then into both of his palpi. In the search for the female he is entirely dependent upon his sense of touch, his sense of sight being entirely inadequate for the purpose. The courtship is therefore very short and consists in beating the female with his front legs. The danger of being hit by the fangs of the excited female is prevented by catching them with the hooks on the front legs. The coitus lasts not longer than one half minute, after which the spiders cautiously separate. A few weeks later the males die apparently a natural death.—ALEXANDER PETRUNKEVITCH.

Endaphis Kieff. in the Americas (Dipt.).

By E. P. FELT, Albany, N. Y.

The discovery of species referable to this genus from widely separated points in the New World is interesting. Last fall we received from Prof. C. H. T. Townsend, Piura, Peru, two specimens of a small midge reared by him from cotton leaves badly infested with galls containing mites. It is possible that these cotton leaves were also infested by small aphids, though none were observed. The North American species has also been reared. The two forms are characterized below.

Endaphis abdominalis n. sp.

Male. Length .25 mm. Antennae nearly as long as the body, thickly haired, yellowish; 14 segments, the first antennal segment greatly produced ventrally and probably dorsally, extending to the middle of the subglobose second antennal segment, the fifth binodose, the two parts of the stem, each with a length over twice its diameter, the enlargements subglobose, each with a thick subbasal whorl of long, stout setae and a well developed subapical circumfilum, the loops of the latter extending to the base of the succeeding enlargement. Palpi quadri-articulate, the first and second segments short, the third with a length about three times its diameter, the fourth as long as the third. Mesonotum fuscous, the submedian lines yellowish. Scutellum yellowish, postscutellum fuscous. Abdomen light yellow, fuscous basally. Genitalia yellowish. Wings hyaline, costa pale straw, subcosta uniting therewith at the basal third, the third vein distinctly before the apex, the fifth, indistinct distally, at the distal third. its branch near the basal third. Halteres yellowish transparent. Coxae and femora yellowish; tibiae fuscous yellowish, the tarsi, especially the distal segments, darker. Claws long, slender, evenly curved, simple, the pulvilli narrow, nearly as long as the claws. Genitalia indistinct.

Female. Length .3 mm. Antennae extending to the second abdominal segment, rather thickly haired, fuscous yellowish; 14 segments, the first antennal segment produced, the dorsal tooth extending to the middle of the subglobose second antennal segment, the fifth subsessile, cylindric, with a length about twice its diameter and thick subbasal and subapical whorls of long, stout setae; terminal segment broadly oval, with a length about $\frac{1}{2}$ greater than its diameter, broadly rounded apically. Palpi probably as in the male. Mesonotum fuscous, the submedian lines yellowish. Scutellum yellowish, postscutellum fuscous. Abdomen yellowish, the basal three segments a variable fuscous. The

slender pulvilli nearly as long as the slender, curved, simple claws. Ovipositor short, the lobes narrowly oval, sparsely setose. Other characters as in the male. The colors are approximate, since the descriptions were drafted from balsam mounts.

Received through Dr. L. O. Howard, from Prof. C. H. T. Townsend, Piura, Peru, and numbered by him 7009. Easily distinguished from *E. perfidus* Kieff. by its much smaller size and the presumably yellow color of the abdomen.

***Endaphis americana* n. sp.**

The first North American representative of this European genus was reared September 2, 1910, from what appeared to be galls of *Eriophyes fraxiniflora* Felt on *Fraxinus velutina* collected by Dr. R. E. Kunze, Prescott, Arizona, August 15th. There was no doubt as to the foliage having been deformed by *Eriophyes*, since mites were rather abundant and relatively large. There may have been a few aphids in addition.

Description. Female. Length 1 mm. Antennae extending to the second abdominal segment, yellowish transparent, slightly fuscous; 14 segments, the first excavated and with the margins produced dorsally and ventrally, the second subglobose, the third and fourth free, the fifth with a stem about $\frac{1}{4}$ the length of the cylindric basal enlargement, which latter has a length about $2\frac{1}{2}$ times its diameter; subbasal and subapical whorls sparse; terminal segment slightly produced, with a length about $2\frac{1}{2}$ times its diameter, broadly rounded apically; mouthparts slightly produced, having a length about 1.3 the diameter of the head. Palpi: first segment subquadrate, the second $\frac{1}{2}$ longer, the third a little longer and broader than the second, the fourth a little longer and more dilated than the third; thorax and base of the abdomen dark fuscous yellowish, the latter yellowish white apically. Wings hyaline, the membrane rather thickly clothed with narrow, curved, hair-like scales; costa dark brown, subcosta uniting therewith near the basal third, the third vein at the distal fourth, the fifth before the distal third, its branch at the basal third. Halteres yellowish transparent. Legs whitish transparent, the distal tarsal segments slightly fuscous; claws slender, strongly curved, simple, the pulvilli nearly as long as the claws. Ovipositor when extended about 1-3 the length of the abdomen, the terminal lobes narrowly lanceolate, with a length about $2\frac{1}{2}$ times the width and sparsely setose apically.

Type Cecid a2066, N. Y. State Museum.

ENTOMOLOGICAL NEWS.

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TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, four weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.—Ed.

PHILADELPHIA, PA., MARCH, 1911.

THE NOMENCLATURE QUESTION.

Dr. C. W. Stiles, Secretary of the International Commission on Zoological Nomenclature, has addressed a letter to the Editor of *Science*, published in the issue of that journal for January 20, 1911, on the subject of Special Committees for Zoological Nomenclature. He writes:

"The International Commission on Zoological Nomenclature is trying a plan of cooperation with international committees representing the various branches of zoology in an effort to determine in how far it will be possible to reach a unanimous agreement upon the names of the most important zoological genera, together with the type species of the genera in question..... The plan adopted is for the secretary to select three or more specialists of unquestioned international reputation in a given group, and to request these workers to add to their committee any colleagues whom they may desire. It is hoped that by this means preliminary studies of fundamental and permanent value may be conducted, and that the contending factions in respect to nomenclature, may be harmoniously united.

The secretary of the commission on nomenclature is adopting the plan of taking man as a center, first working out, so far as may be done unanimously, names to be adopted for the animals most intimately associated with man, and while the undertaking may require years of patient labor, it is hoped eventually to establish a list of not less than ten thousand generic names, agreed upon unanimously, first by the special nomenclature. It is hoped, further, that by this plan an immense special committee, and then passed upon unanimously by the commission number of useless synonyms can be unanimously agreed upon as such, and gradually eliminated from general zoological literature.

The scheme naturally depends upon the amount of cooperation on the part of the special committees, which will be formed as rapidly as the work will justify."

This seems to us a step in the right direction. To establish names by common consent and the sanction of a supreme international body, instead of by the ever uncertain appeal to priority, will do away with one of the chief reproaches to zoological work. We hope that entomologists will do their utmost to assist the Commission, so that our nomenclature will no longer speak a different language this morning from that which it uttered last night.

Notes and News

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

DR. E. P. FELT has reviewed the fifth volume (1910) of F. V. Theobald's Monograph of the Culicidae or Mosquitoes in *Science* for Jan. 27, 1911.

MR. FRANCIS E. BOND, a retired Philadelphia broker, accompanied by Mr. Stewardson Brown, botanist of the Academy of Natural Sciences, and Thomas F. Gillin, an amateur naturalist, are on their way to Venezuela, where they will devote at least four months to the collection of specimens for the museum of the Academy of Natural Sciences, of Philadelphia, and for the Philadelphia Zoological Garden. Although the expedition is for the purpose of enriching the collection at the museum and the Zoological Garden, the entire expense of the journey will be defrayed by Mr. Bond.

THE scientific services of the United States Department of Agriculture are described by M. G. Severin (Conservator in the Royal Museum of Natural History at Brussels and Secretary General of the recent International Congress of Entomology in that city) in a paper of forty pages extracted from the *Bulletin de la Societe centrale forestiere de Belgique*, Brussels, 1910. His account of the history, organization and accomplishments of the department, in which the Bureau of Entomology occupies a prominent place, concludes: "Such is a very fragmentary view of the department whose activities are very popular in the United States. Not only that great country can pride itself on the fruitful work of the bureaus, but also the entire world owes it recognition for the great value of the scientific and economic works which it publishes, for these works contain information useful to all those concerned with the enrichment of national agricultural productions. Such labor satisfies the two principal conditions which science ought to fulfil; to understand the secrets of nature—pure science, and to become master of them—applied science."

NOTE ON THE MELOID-GENUS *HORNIA*, RILEY, AND ITS ALLIES.—[Apropos of Dr. Wellman's recent article in the *News* for January, 1911, on a new species of *Hornia*, the following from Ent. Monthly Mag., XLVII, pp. 16, 17, London (Jan. 1911) is of interest.]—My friend, Manuel Martinez de la Escalera, during a visit to Horsell last week, showed me two living examples of a remarkable Sitarid he had just bred from pupæ found in the cells of an *Anthophora* in walls at Mogador, Morocco. This insect has recently been described by him as a new genus and species under the name *Allendesalazaria nymphoides* (Boletin Soc. Españ. Hist. Nat., 1910, pp. 379-382), but he was apparently unaware of the fact that there were two extremely closely allied known American forms. One of these latter, *Hornia minutipennis*, Riley, from Missouri, has simple tarsal claws, the other, *Leonia rileyi*, Dugès, from Mexico, has the tarsal claws armed with a very long tooth, and both insects also attack *Anthophora*. *Allendesalazaria* has the tarsal claws formed as in *Hornia*, and there can be little doubt that these two genera must be very closely related.*

The American insects have been very fully described and figured, and their habits noted in detail by Riley† and Dugès‡ respectively. Dugès placed them under a separate section (*Horniides*) of the Meloidæ, mainly on account of their minute elytra, and this arrangement was adopted by me when dealing with the Mexican forms (Biol. Centr.-Am., Coleopt., iv, 2, p. 370). The two genera, however, are very nearly related to *Sitaris*, which also attacks *Anthophora*. The American and Moroccan insects are recorded as having been found upon walls in the vicinity of the nests of these mason-bees, after the manner of our own *Sitaris muralis*. According to M. Escalera, the female of *A. nymphoides* does not leave the gallery of the bee. It would be interesting to compare *Hornia minutipennis* with the Moroccan *A. nymphoides*, but unfortunately this is not possible. I saw a co-type of *Leonia* in Paris many years ago, in the collection of A. Sallé. *Hornia* is known to me from description alone.—G. C. CHAMPION, Horsell, Woking; December, 1910.

*Since this note has been in type M. Escalera writes me as follows: *Allendesalazaria* is valid, and may be separated from *Hornia* by the following characters:

Scutellum cordiform; wings one-fifth shorter than the elytra; antennæ short (in the ♀ a little longer than the head, in the ♂ as long as the head and thorax together), the third joint longer than the others
Hornia, Riley.

Scutellum transverse; wings wanting; antennæ longer (in the ♀ reaching the posterior border of the prothorax, in the ♂ extending considerably beyond it), the third joint not longer than the others

Allendesalazaria, Esc.

† Trans. Acad. St. Louis, iii, p. 564, t. 5, figs. 13, a—d (1877).

‡ Insect Life, i, no. 7, pp. 211-213, figs. 47, b—f (1889).

LORD AVEBURY (Sir John Lubbock) has been elected a corresponding member of the Paris Academy of Sciences, in the section of anatomy and zoology.

NOTES ON THE LIFE HISTORIES OF TABANIDAE (DIPTERA).—On April 15, 1909, I found two larvae of *Tabanus*, under the bark of a soggy log lying in the water of a swamp, the surface of the log being an inch or two above the water. One died before I reached home, the other was put into a bottle with some wet dirt and rotten wood, and from this a male of *Tabanus trimaculatus* was bred on May 18 of same year. The larva that died and which was presumably the same species was preserved in alcohol. It measures 37 mm. in length and is white without markings.

Late in March of the same year while looking under stones in a small, clear woodland stream, I found another *Tabanus* larva under a stone, which was quite lively, and seemed thoroughly at home in the clear water. This I kept in a bottle with some wet leaves and practically forgot it. However, on May 18 it had transformed to a pupa, and thirteen days later, on May 31 a male of *Tabanus melanocerus* emerged from the pupa. The larva was approximately the same size as the *trimaculatus* larvae, and was like them, white without darker bands.

I have also on several occasions bred a third species of *Tabanus*, namely *T. fronto*. The larvae of this species occur in the soil of my garden, which is rather dry and right on the crest between two water sheds, the nearest permanent water being at least a quarter of a mile away. These larvae are white with pale brown transverse bands, and transform into pupae in June or July, and into flies some two or three weeks later. The earliest date on which an adult has emerged is July 4, which is also the earliest date on which I have seen the species in the field. Two larvae which I have in alcohol are yellower than the *trimaculatus* larva mentioned above, but show no trace of the pale brown bands which exist in life. The largest of these two measures 36 mm. long and was taken July 5, while the smaller one is 33 mm., taken on March 31. Both, as also the preserved *trimaculatus*? larva, are well, but not abnormally, extended. The only pupa which I have found of this species was under a stone in my back yard.

Although horseflies do not generally breed away from water, *T. fronto* seems to be an exception, as larvae have been taken in my garden in several different years, while the adults occur more commonly in my garden and in my house than any other species of the family, the flies quite frequently entering the house, while newly emerged specimens have been noted on a number of occasions. I sent detailed notes on this species to Prof. J. S. Hine some years ago, but do not think he has published anything on the subject as yet.—C. S. BRIMLEY, Raleigh, N. C.

ORTHOPLLEURA DAMICORNIS.—During July, 1909, at Craighead Station, I chopped a Buprestid larvae (Chrysobothrid?) from a dying limb of a pecan tree (*Hicorea pecan* Britt.) The larva was placed in its burrow and kept caged until it shriveled up and died. A few days later a small parasite emerged measuring about 6 or 7 mm. in length and subsequently grew in size to about 10 or 12 mm. It was observed as pupated on April 25, 1910, emerging an adult *Orthoppleura damicornis* May 19, 1910. This insect was kindly determined for me by Mr. A. B. Wolcott of Field Museum, Chicago.—F. C. CRAIGHEAD, State College Pa.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), excluding Arachnida and Myriapoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted. This (*) following a record, denotes that the paper in question contains description of a new North American form.

For record of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

- 1—Proceedings, Academy of Natural Sciences of Philadelphia.
- 2—Transactions, American Entomological Society, Philadelphia.
- 4—The Canadian Entomologist. 7—U. S. Department of Agriculture, Bureau of Entomology. 9—The Entomologist, London. 11—Annals and Magazine of Natural History, London. 22—Zoologischer Anzeiger, Leipzig. 35—Annalen, Societe Entomologique de Belgique. 46—Tijdschrift voor Entomologie, The Hague. 47—The Zoologist, London. 50—Proceedings, U. S. National Museum. 54—Journal, Royal Horticultural Society, London. 67—Entomologische Tidskrift, Stockholm. 89—Zoologische Jahrbucher, Jena. 92—Zeitschrift fur wissenschaftliche Insektenbiologie, Berlin. 143—Ohio Naturalist, Columbus. 148—New York Agricultural Experiment Station, Geneva. 166—Internationale Entomologische Zeitschrift, Guben. 181—Guide to Nature, Sound Beach, Conn. 186—Journal of Economic Biology, London. 187—Jahrbucher des Nassauischen Vereins fur Naturkunde, Wiesbaden. 193—Entomologische Blatter, Nurnberg. 216—Entomologische Zeitschrift, Stuttgart. 238—Anales, Sociedad Cientifica Argentina, Buenos Aires. 285—Natur-Study Review, Urbana, Illinois. 305—Deutsche Ento-

mologische National-Bibliothek, Berlin. 306—Journal, College of Agriculture, Imperial University of Tokyo. 307—Annales, Societe Linneene de Lyon (n. ser.). 308—Bollettino, Societa di Naturalisti in Napoli. 309—Verhandlungen des Naturhistorischen Vereins der preussischen Rheinlande und Westfalens, Bonn. 310—L'Echange, Revue Linneene, Moulins. 311—La Science au XXe Siecle, Paris. 312—American Journal of Pharmacy. 313—Bulletin of Entomological Research, London.

GENERAL SUBJECT. Anon.—Cinematographie du vol des Insectes, 311, ix, No. 97, 3 pp. Reinick, W. R.—Insects destructive to books, 312, 1910, 551-562. Swinton, A. H.—The vocal and instrumental music of insects, 47, xv, 14-24. Tragardh, I.—Om Berlese's apparat for snabb och effektivt insamling of sma leddjur, 67, xxxi, 35-38. Tucker, E. S.—Random notes on entomological field work, 4, xliii, 22-32. Xamheu, C.—Moeurs et metamorphoses des insectes. 16 Memoire, 3d fasc., 307, lvii, 67-116.

APTERA AND NEUROPTERA. Bagnall, R. S.—Notes on some Thysanoptera, 35, liv, 461-464. Sasaki, C.—On the life history of *Trioza camphorae* n. sp. of camphor tree and its injuries, 306, ii, 277-286. Van der Weele, H. W.—Collections Zoologiques du Baron E. de Selys Longchamps. Catalogue systematique et descriptif. Megaloptera, Fasc. v, pt. 1, 93 pp.

ORTHOPTERA. Anon.—A Locustid injurious to man, 313, i, 227. Rehn & Hebard.—Records of Georgia and Florida Orthoptera, with the descriptions of one new sp. and one new subsp., 1, 1910, 585-589 (*). Preliminary studies of No. Carolina Orthoptera, 1, 1910, 615-650.

HEMIPTERA. Crosby, C. R.—Notes on the life-history of two species of Capsidae, 4, xliii, 17-20. Osborn, H.—Remarks on the genus *Scaphoideus* with a revised key and descriptions of new American species, 143, xi, 249-260 (*). A n. sp. of *Tinobregmus*, 143, xi, 261 (*). Pierantoni, U.—L'origine di alcuni organi d'Icerya purchasi e la simbiosi ereditaria, 308, xxii, 147-150.

LEPIDOPTERA. Busck, A.—On the gall-making moths on *Solidago* and *Aster*, with description of two n. sp., 4, xliii, 4-6 (*). Chagnon, G.—Lepidoptera taken at St. Fabien, Que., 4, xliii, 1-3. Coolidge, K. R.—On the genus *Mastor*. G. & S., 4, xliii, 6-8. Courvoiser, Dr.—Entdeckungsreisen und kritische Spaziergange ins Gebiet der Lycaeniden, 216, xxiv, 59-60, 70-71, 77-79, 81-82, 88-89, 92-94, 99-101, 106-108, 112, 125-127, 131-132, 135-137, 141-142, 147-149, 156, 167-170, 175-177, 181-182, 185, 192, 196-214, 234-236. Eltringham, H.—African mimetic butterflies. Oxford at the Clarendon Press, 1910, 136 pp. Fountaine, M. E.—An autumn morning in the Alleghany Mountains, 9, xlv, 14-15. Frohawk, F. W.—The

number of larval stages of *Lycaena acis*, 9, xlv, 13-14. **Grossenbacher, J. G.**—Medullary spots: a contribution to the life history of some Cambium miners, 148, Tech. Bul. No. 15, 49-65 pp. **Haverhorst, P.**—Over de Staartspitsen onzer Heterocera-poppers, 46, liii, 283-304. **Isemann, S.**—Massenflug einer brasilianischen Coside, 216, xxiv, 231-232. **Jacobson, E.**—Anlasslich der "Beobachtungen ueber den Polymorphismus von *Papilio memnon*", 46, liii, 234-277. **Joseph, E. G.**—On the Lepidoptera Rhopalocera collected by W. J. Burchell in Brazil, 1825-30, 11, vi, 9-18. **Lindemans, J.**—Een merkwaardig *Cethosia Wijffe* van Yule-Island (Eng. Nieuw-Guinea), 46, liii, 280-281. **Rangnow, H.**—Lebensweise und Zucht einer neuen palaearktischen Noctuide (*Polia philippsi*), 166, iv, 231-233. **Schaus, W.**—New species of Heterocera from Costa Rica, 11, vi, 33-84 (*). **Scheele, M.**—Instinkt oder Gedachtnis? 166, iv, 216-217. **Sheldon, W. G.**—Notes on the life-history of Paragehiera, with description of the full-grown larva, 9, xlv, 1-4. **Thierry-Mieg, P.**—Descriptions de lepidopteres nouveaux, 35, liv, 465-469. **Tragardh, I.**—Larktradsmaalen (*Coleophora laricella*), 67, xxxi, 258-264. **Clercks minerarmal** (*Lyonetia clerckella*), 67, xxxi, 266-271. **Walsingham, Lord.**—*Biologia Centrali-Americana*. Lepidoptera, Heterocera, iv, 41-48 (*). **Weymer, G.**—Die Grossschmetterlinge der Erde. Fauna Americana, 22 Lief. vi, 177-192. *Pierella*, *Antirrhaea*, *Taygetis*.

DIPTERA. **Anon.**—Catching "Flies" by tons a lost industry, 181, iii, 374-375. A campaign against flies in a town of 6,000, 285, vi, 10-14. Mosquito larvae and their natural enemies, 313, i, 213-218. **Aldrich, J. M.**—A decision on Meigen's 1800 paper, 4, xliii, 34-35. **Boyce, R.**—The prevalence, distribution and significance of *Stegomyia fasciata* in West Africa, 313, i, 233-263. **Carpenter, G. H.**—Notes on the warble-fly of the reindeer (*Oedemagena taurandi*), 186, v, 149-156. **Cresson, E. T., Jr.**—Studies in No. Am. Dipterology. Pipunculidae, 2, xxxvi, 267-329 (*). **Davey, J. B.**—Notes on the habits of *Glossina fusca*, 313, i, 143-146. **Enock, F.**—Two insects affecting wheat and barley crops, 54, xxxvi, 323-330. **King, H. H.**—Some observations on the bionomics of *Tabanus par*, and *T. taeniola*, 313, i, 99-104. Some observations on the bionomics of *Tabanus ditaeniatus* and *T. kingi*, 313, 1, 265-274. **Rothschild, N. C.**—A synopsis of the fleas found on *Mus norwegicus decumanus*, *Mus rattus alexandrinus* and *Mus musculus*, 313, i, 89-98. **Sharpe, A.**—Notes on the habits of *Glossina morsitans* in Nyasaland and the adjoining territories, 313, i, 173-175. **Thienemann, A.**—Das Sammeln von Puppenhauten der Chironomiden. Noch einmal eine Bitte um Mitarbeit, 22, xxxvii, 62-63. **Weber, E. I.**—Ueber regeneratahnliche Flugelmissbildung einer Stubenfliege

(*Musca domestica*), 22, xxxvii, 1-7. **Wesche, W.**—On the larval and pupal stages of West African Culicidae, 313, i, 7-54.

COLEOPTERA. **Arrow, G. J.**—Notes on the Lamellicorn beetles of the genus *Golofa* with descriptions of three new species, 11, vii, 136-141 (*). **Bernhauer, M.**—Beitrag zur Kenntnis der Staphyliniden-Fauna von Zentralamerika, 44, lx, 350-393 (*). **Bowditch, F. C.**—Notes on *Diabrotica* and descriptions of n. sp. (continued), 4, xliii, 9-16. **Brethes, J.**—Coleopteros Argentinos y Bolivianos, 238, lxix, 205-227. **Champion, G. C.**—Some new Curculioninae from Central and South America, 11, vi, 94-98 (*). *Biologia Centrali-Americana. Rhynchophora: Curculionidae (continued).* Vol. IV, pt. 7, 151-221 (*). **Dalla Torre, K. W.**—Coleopterorum catalogus. Pars 25: Cebrionidae, 18 pp. **Deibel, J.**—Beitrage zur Kenntnis von *Donacia* und *Macrolea* unter besonderer Berücksichtigung der Atmung, 89, xxxi, 107-160. **Hopkins, A. D.**—Contributions toward a monograph of the bark-weevils of the genus *Pissodes*, 7, Tech. Ser. No. 20, 1-68 pp. (*). **Kleine, R.**—Biologische Beobachtungen an *Pyrochroa coccinea*, 193, vii, 13-16. **deLapouge, G. V.**—Tableaux de détermination des formes du genre "Carabus," 310, 1910, 4-5, 11-12. **Pic, M.**—Sur divers Cantharides (Telephorides) de l'Amerique meridionale, 310, 1910, 3-4. *Coleopterorum catalogus. Pars 26: Scaphitidae, Pedilidae*, 27 pp. **Tolg, F.**—*Billaea pectinata* (*Sirostoma latum*) als Parasit von Cetoniden und Cerambyciden-Larven. Metamorphose und aussere Morphologie der Larve (Schluss), 92, vi, 426-430.

HYMENOPTERA. **Adlerz, G.**—Stekellarver som ytterparasiter pa fritt kringstrofvande spindlar, 67, xxxi, 97-100. **Cockerell, T. D. A.**—Some bees from Western Canada, 4, xliii, 33-34 (*). **Crawford, J. C.**—New So. Am. parasitic Hymenoptera, 50, xxxix, 235-239. **Emery, C.**—Einiges ueber die Ernährung der Ameisenlarven und die Entwicklung des temporären Parasitismus bei *Formica*, 305, ii, 4-6. **Hoppler, H.**—Beitrage zur Biologie niederrheinischer *Rubus*wohner, 309, lxvi, 265-275. **Roman, A.**—Notizen zur Schlupfwespensammlung des schwedischen Reichsmuseums, 67, xxxi, 109-196 (n. gen.). **Schulz, W. A.**—Ein Beitrag zur Kenntnis der Lebensweise, Systematik und geographischen Verbreitung der Trigonaloiden, 67, xxxi, 103-108. **Strand, E.**—Ueber einige amerikanische Hymenopteren des Naturhistorischen Museums zu Wiesbaden, 187, lxiii, 9-18. **Tragardh, I.**—Roda tallstekeln (*Lophyrus seritifer*), 67, xxxi, 272-279. **Tullgren, A.**—Vaxtsteklar, som angripa vara fruktträd, 67, xxxi, 286-295. **Viereck, H. L.**—New sp. of reared ichneumon-flies, 50, xxxix, 401-408 (*). **Wasmann, E.**—Gibt es erbliche Instinktmodifikationen im Verhalten der Ameisen gegenüber ihren Gasten? 22, xxxvii, 7-18.

Doings of Societies.

AMERICAN ENTOMOLOGICAL SOCIETY.

A meeting was held December 22nd, 1910. Dr. Philip P. Calvert, President in the chair. Ten persons present. The reports of the Treasurer, Curator and Librarian were read. This being the annual business meeting, the following officers for 1911 were duly elected:

President, Philip P. Calvert; *Vice-President*, Henry W. Wenzel; *Treasurer*, E. T. Cresson; *Recording Secretary*, Henry Skinner; *Corresponding Secretary*, E. T. Cresson, Jr.; *Curator*, Henry Skinner; *Librarian*, E. T. Cresson, Jr.; *Publication Committee*, E. T. Cresson, C. F. Seiss and B. H. Smith; *Executive Committee*, Philip Laurent, H. W. Wenzel and D. M. Castle; *Finance Committee*, J. W. McAllister, C. S. Welles and D. M. Castle.

HENRY SKINNER, *Secretary*.

ENTOMOLOGICAL SECTION OF THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA.

A meeting was held December 22nd, 1910. Ten persons present. In the absence of the Director and Vice-Director, Dr. D. M. Castle presided. The annual reports of the officers were read. Mr. E. T. Cresson, Chairman of the Publication Committee, stated that on October 27th last he had received the resignation of Dr. Henry Skinner as Editor of ENTOMOLOGICAL NEWS and that it had been accepted with regret. Dr. Philip P. Calvert was elected Editor, E. T. Cresson, Jr., Associate Editor, Erich Daecke was elected a member of the Advisory Committee and Dr. Henry Skinner Editor Emeritus.

Dr. P. P. Calvert exhibited a larva and an adult of the Odonate genus *Cora* from Costa Rica, interesting as possessing tracheal gills along the ventral side of abdominal segments 2-7 of the larva. It is the first American species known to possess such gills, although Hagen in 1880 described larvae of the Oriental genera *Euphaea* and *Anisopleura* which have gills

similarly situated. Such gills are probably modified abdominal legs. The existence of such gills is held to indicate the descent of Odonata and Ephemera from animals with abdominal legs.

The following were elected to serve as officers for the ensuing year:

Director, Philip Laurent; *Vice-Director*, H. W. Wenzel; *Treasurer*, E. T. Cresson; *Recorder*, Henry Skinner, *Secretary*, E. T. Cresson, Jr.; *Conservator*, Henry Skinner; *Publ. Committee*, E. T. Cresson and E. T. Cresson, Jr.

HENRY SKINNER, *Recorder*.

BROOKLYN ENTOMOLOGICAL SOCIETY.

The annual meeting at 55 Stuyvesant Ave., January 12, 1911, was attended by 22 members and four visitors. The officers, with the exception of the Librarian, were re-elected: *President*, Dr. John B. Smith, *Vice-President*, Geo. P. Engelhardt; *Treasurer*, Chris. E. Olsen; *Recording Secretary*, R. P. Dow; *Corresponding Secretary*, A. C. Weeks; *Curator*, Geo. Franck; *Librarian*, Silas C. Wheat; *Delegate to the New York Academy of Sciences*, John B. Smith.

A dinner is to be held some time during February by the Brooklyn, New York and Newark Entomological Societies.

Mr. William Wasmuth described the eggs of the genus *Catocala*, of which he has bred nearly all the local species. The eggs of *clonympha* and *nubilis* differ radically from the others, supporting the contention that these species belong to different genera. A number of species hibernate as pupae.

R. P. Dow, *Recording Secretary*.

NEWARK ENTOMOLOGICAL SOCIETY.

Meeting of September 11, 1910; thirteen members and two visitors. Messrs. Matausch, of Newark, N. J., and Bird, of Rye, N. Y., present.

Mr. Bird read a paper on "New York City's fifty-mile

faunal zone as relating to the Noctuid genus *Papaipema*." He dwelt chiefly upon the habits of the various species, and related his experience in discovering their life histories. To date he has worked out the life histories of all the known species in the area treated with the exception of two. The paper was illustrated by a box of specimens showing the seven new species he has discovered within the confines of New York City, together with their larvæ, pupæ and parasites, and samples of their work in the plants into which they respectively bore.

Mr. Buchholz reported the capture, at Lakehurst, of *Catocala similis* June 24 and July 10, *Hyperaeschra georgica*, May 30, and *Acronycta tritona*, May 30, July 10 and Sept. 3. He remarked that the latter was apparently triple brooded. *Catocala similis* larvæ were not rare on a species of scrub oak, all the larvæ collected producing very dark specimens of the adults.

Meeting of October 9, 1910; nineteen members and two visitors, Messrs. Beutenmüller and Matausch, present.

Mr. Beutenmüller exhibited a small box of *Catocalae* on which he commented as follows:

C. judith he had previously made a synonym of *C. orba* of Russia on the strength of Strecker's excellent figure of the upper side, the two, as he pointed out, being identical above. Upon the receipt of a specimen of the former species, however, he discovered them to be very different beneath and on structural characters proved to belong to different sections of the genus, *orba* falling in with the *ultronia* group while *judith* associates with the members of the *robinsonii* group. From Texas he received a dark form of *C. jair* which he said may be passing current as *C. amica*. *C. beutenmulleri* B. & McD., recently described, is the male of *C. warneri* Poling.

Mr. Buchholz said that the specimen of *Catocala jair* taken by him at Lakehurst and reported at the April meeting of the Society, was an example of the dark varietal form shown by Mr. Beutenmüller.

Mr. Kearfott spoke at some length on the methods employed in capturing, rearing and preparing Micro-lepidoptera and of the magnitude of the field for the ardent worker. As an illustration of what might be done anywhere he said that in New Jersey, the insect fauna of which is better known than that of any other State, over 50 per cent. of the species recorded during the past ten years were new to the State, and that eventually the present number of species known from that region—about 1500—will be increased to 3000.

Micro-lepidoptera in general are very easily bred. The larvae are simply collected and placed in small screw-top vials in which the food keeps fresh from ten days to two weeks. In that period of time most micro-lepidoptera, if not too small when collected, will have reached the pupal stage. Occasionally mould sets in; but this is unusual, and when it occurs the screw-top should be removed and a bit of cheese cloth substituted.

All breeding notes may be put on 8x10 cards and filed away, the name of the species being added when obtained.

Very interesting in their life history are certain species of Micropterygidae which were discovered mining in the leaves of oak, birch and chestnut. The larvæ cause blotches on the leaves as large as a silver dollar. They become full grown in about ten days when they drop to the ground and remain as larvæ until the following April when the pupal condition is assumed. Beyond this stage the species were not reared, the group determination being made by the pupæ which show the peculiar long folded maxillary palpi.

Equally interesting are the species of *Nymphula* which have been bred by Dr. W. T. M. Forbes. The larval life is spent beneath the surface of the water and tracheal gills are developed, though functionless spiracles are present as well.

All Micro-lepidoptera are best captured as adults in the evening just after sundown. Mr. Kearfott has taken between 200 and 300 specimens representing dozens of species in a space fifty feet square at this time of day.

The condition of the white birch forests of Vermont, Massachusetts, and to some extent, Maine, is serious as a result of the attacks of a species of *Bucculatrix* which causes them to appear as if swept by fire. The minute larvae between one-fourth and three-eighths inch in length are at first leaf miners, but later come outside to feed. Three to six larvae were on each leaf and every leaf on each tree was infested. By estimate there were about 100,000 examples to a tree. *Betula lenta* was also sparsely attacked but only where there was a dearth of white birches.

Mr. Brehme reported the occurrence of *Catopsila eubule* at Beach Haven, Ocean Co., on Sept. 27 and the capture of a perfectly fresh example of *Argynnis idalia* at Fairton, N. J. on Sept. 16.

Meeting in Turn Hall, on November 13, 1910; fourteen members present.

Mr. Buchholz showed two boxes of *Catocala gracilis* and *similis* which were taken by himself and Mr. Keller at Lakehurst. He also reported *Glea tremula*, *G. viatica* and *G. sericea* from the same locality on Sept. 25, and *Caripeta angustiorata* on May 30. He took a specimen of *Papaipema duarvata* Bird, at Elizabeth, and *P. stenocelis* Dyar, a species recently described from Virginia, at Lakehurst.

Mr. Brehme made a few remarks on the Periodical Cicada which is due to appear in New Jersey in 1911. He said the towers which are usually constructed by the pupae in moist situations were extremely abundant in Cape May Co. at the present time (Nov. 13, 1910). Millions of them from one to three inches high were erected in moist and in absolutely dry places. An attempt was made to secure some of the pupae by digging into the ground, but apparently they had retreated to a considerable depth as none could be found even two and a half feet below the surface.

Mr. Lemmer said he took a specimen of *Acronycta elizabeti* at Irvington, N. J.

Mr. Grossbeck exhibited a specimen of the rare *Sphinx franckii* from Johnson City, Tennessee.

Meeting in Turn Hall, December 11, 1910; ten members and one visitor, Mr. Matausch, present.

Mr. Brehme exhibited a box of *Hemileuca*, showing in small series all but three of the North American species.

Mr. Matausch spoke concerning the Membracidae and showed many enlarged water color sketches of both nymphs and adults. He outlined his experience in breeding *Ceresa taurina* and *Campylenchia curvata*. Moulting always takes place, so far as his observations went, in the early morning hours and the full coloration of the individuals is attained in about two hours after moulting. The fact that he has repeatedly found skins of young nymphs on the same twig as the fully grown individual indicates that the entire nymphal life is passed on one stem.

Ants frequently attend membracids and particularly the young nymphs. He has observed three species attending *Vandusia arcuata* and stated that some species of membracids are preferred to others. A few species apparently have no ant attendants at all. Among the species that were bred from nymphs by Mr. Matausch were *Ceresa palmeri* which occurs on sweet gum, *Carynota mera* which feeds on black oak and a species of *Cyrtolobus* which developed on oak.

The officers elected for the ensuing year were as follows: *President*, Otto Buchholz; *Vice-President*, F. Lemmer; *Secretary*, H. H. Brehme; *Financial Secretary*, T. D. Mayfield; *Treasurer*, Geo. J. Keller; *Librarian*, Wm. H. Broadwell.

JOHN A. GROSSBECK, *Secretary*.

Meeting at the Newark Turn Hall, Sunday, January 8, 1911, seventeen members present, President Buchholz in the chair.

Mr. Grossbeck was appointed a Committee of one to represent the Newark Society in arranging for a supper and meeting of Entomologists with the New York and Brooklyn Societies. Mr. Kearfott's invitation to have the Society meet and look over his collection of Micro-lepidoptera on February 12th was accepted.

Mr. Buchholz exhibited a very interesting series of *Pseudo-*

hazis eglanterina, *nuttalli*, *shastaensis* and *denudata* which brought forth a lengthy discussion between Messrs. Angelman Franck and Prof. Smith, about the geographical range and variations of these species.

Mr. Franck stated that he has received a large number of *Hyperchiria incarnata* from the northern border of Mexico, which comes so close to *H. pamina* that he thinks it is only a dark form of *pamina* and that *pamina* is a geographical form of *incarnata*.

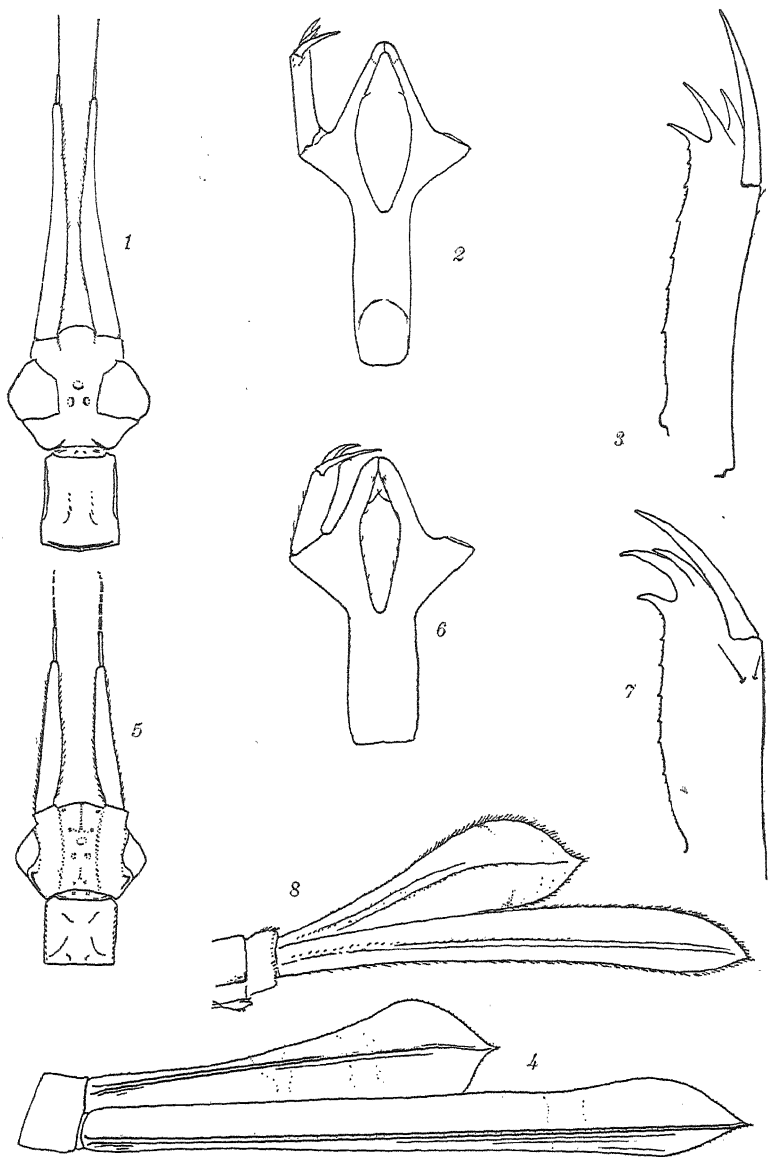
Prof. Smith gave a very interesting talk on Entomology in Europe. He spoke on what he learned on his recent trip to Germany, Holland and Belgium where he went for the interest of the American Nurserymen to protect them from further importation of destructive insects, and to find out under what conditions *Azolla* grows. Prof. Smith said that all nursery stock that is shipped into Germany is closely inspected and the least trace of scale or other insects is sufficient to condemn the entire shipment, and the man to whom it is addressed is notified and his choice is given to send it to some other State or have it destroyed. On the other hand no attention is given to stock which leaves Germany, no matter how bad the same may be infested, and therefore a constant watch has to be kept on nursery stock imported from European countries into the United States to prevent further importation of destructive insects.

The *Azolla*, which was to be introduced into New Jersey to plant out in pools, ponds, etc., to prevent mosquitoes breeding, will be of no use in New Jersey, as it will not grow on salt marshes and cannot survive our cold winters.

About five hundred specimens were donated by members for the new cabinets.

HERMAN H. BREHME, *Secretary*.

Erratum: Line 20 from top of page 55 (February News) should read: stomach (Pl. II, figs. 17, 19, *lpgt*). The rectum has four tracheae, two



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ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

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Descriptions of Dragonfly Nymphs of the Subfamily Calopteryginae (Odonata).

BY JAMES G. NEEDHAM, Cornell University, Ithaca, N. Y.

(Plates IV, V.)

The basis of our present knowledge of the immature stages of this group of dragonflies was laid by Dr. Hagen in a paper but a few pages in length, published in 1880,* under the title "*Essai d'un Synopsis des Larves des Calopterygines.*" Nymphs of *Calopteryx* had been described earlier, and in that genus and in *Hetacrina* fuller descriptions have appeared since; but with the exception of a few undetermined forms described by Karsch in 1893 † and a few figures of nymphal labia published by Miss Hortense Butler in 1904, ‡ that little paper has until quite recently represented all our knowledge of the systematic relations of the immature stages of the group. Yet that paper was merely synoptic, without other descriptions than mere diagnostic statements of group characters, and it was not illustrated.

*In *C. R. Soc. Ent. Belg.*, Vol. 23, pp. lxx-lxxvii. Abstracted by McLachlan, in *Ent. M. Mag.*, Vol. 17, p. 90; also in *Zool. Anz.*, Vol. 3, pp. 304-305.

† *Berl. Ent. Zeit.*, Vol. 38, pp. 47-48.

‡ *Trans. Amer. Ent. Soc.*, Vol. 30, pp. 127-128, pl. V, figs. 1-6.

During 1907 I had the privilege (due to the courtesy of Mr. Samuel Henshaw) of studying Hagen's specimens in the Museum of Comparative Zoology. Of two of the species of the Synopsis, (the *Euphaea splendens* of Ceylon and the fragment doubtfully referred to the genus *Cora*) I could find no trace. The others I found and studied, and also two additional members of the group here treated, not noticed by Hagen in that paper, and perhaps of later acquisition by him. By the study of the venation of the developing nymphal wings I was able to make closer determination of some of the forms, confirming his determination of *Neurobasis*, but finding his *Anisopleura comes* to be in fact a species of *Bayadera*, and his *Euphaea dispar*? to be probably *Anisopleura comes*. The new descriptions and figures of these forms made at that time were laid aside because other matters were more pressing. Recently Mr. Tillyard's rearing of the nymph of the Australian *Diphlebia lestoides*, * and Dr. Calvert's still more recent and most welcome discovery of the nymph of *Cora* † have revived my interest in the matter, and have led me to offer these notes and figures for publication in the News.

The greatest interest has attached to the nymphs of the "Legion Euphaea" of de Selys, doubtless because of their possession of paired lateral filamentous tracheal gills on most of the abdominal segments (a character appearing in somewhat altered form in *Cora*). On this account one of Hagen's types was figured in Packard's Text-book of Entomology (p. 469). The figure is small and inadequate for specific determination; but since it shows no spines on the frons it perhaps represents the "Euphaea splendens" of the "Synopsis," which Hagen says was verified by Nietner, and which I was unable to find reposing in the collection at the time my studies were made. Tillyard has shown that *Diphlebia* lacks external paired lateral gills; and I am here describing another member of the "Legion" that lacks them, from Jamaica. The wing venation is not well enough preserved to render determination very cer-

**Proc. Linn. Soc., N. S. Wales*, Vol. 34, pp. 370-383, pl. 33, 1909.

†*Entom. News*, Vol. 22, pp. 49-64, 1911.

tain, and no Calopterygine other than *Hetaerina* is at present known from Jamaica. The characters of the caudate gills and of the mandibles are sufficiently interesting, even though the nymphs are not fully determinable.

Herewith I describe briefly and illustrate nymphs, I judge to belong to the following species: *Neurobasis chinensis* Linn; *Calopteryx angustipennis* Sel.; *Anisopleura comes* Hagen; *Bayadera indica* Sel.: Unknown nymph from Jamaica.

Neurobasis chinensis (supposition). (Plate IV, figs. 1-4.) Hagen, C. R. Soc. Ent., Belg., Vol. 23, p. lxx, 1880.

Several well grown nymphs in which the venation of the adult could be in part recognized in the wings enabling me to verify generically, at least, Dr. Hagen's supposition. No. 302, M. C. Z., "Billespur, Himalaya, India. Carleton, 1872."

Length, 30; lateral gills, 13 additional; median gill only 9 mm.; abdomen, 20; hind femur, 7 mm.; width of head, 3 mm.; of abdomen, 2.2 mm.

Body very elongate, slender and smooth. Head depressed, longer than wide, narrowed both ways from the laterally prominent eyes, and without dorsal tubercles. Antennae very long, the basal segment being about twice as long as the head is wide, fusiform, and pubescent, especially upon the inner side, the second segment about one-eighth as long as the first, and the remainder comprised in an unjointed slender and tapering flagellum, that is somewhat longer than the second joint. Labium slender, the tines reaching posteriorly to the mesothorax, basal half of the mentum with parallel sides, suddenly widening just beyond the middle to the bases of the lateral lobes, and then regularly narrowing to the greatly produced tip, the anterior half being occupied by a deep and wide oval median cleft, that is closed in front by the close apposition and partial adherence of the slender lobes that bound it; these lobes show a slight constriction near the tip, and there is a pair of spinules on the inner margins of the cleft at two-thirds its length. The median cleft descends through somewhat more than half the length of the mentum. The lateral lobes are very slender, almost linear, with doubly and finely serrate inner margin, ending in a slender and nearly straight hook, above which are two similar but larger hooks on end, and above these three that together terminate the lateral lobe is the usual movable hook on the external margin, with three minute spinules just before its base above.

Legs not remarkably long, but slender. Wing cases reaching the fourth abdominal segment. Abdomen long, cylindric. Gills long, straight, slowly tapering and then suddenly enlarged just before the tips, after which they are abruptly narrowed to the end, the lateral ones triquetral, the median flat, with a carina each side, and one-third shorter than the laterals.

Calopteryx angustipennis (supposition). (Plate IV, figs. 5-8.)

A single immature female specimen, M. C. Z., No. 307, "Green River, near Mammoth Cave, Ky., 4-11-'74, Putnam."

Length 20 mm., lateral gills 12 mm. additional, the median gill 9 mm., abdomen 13 mm., antenna 8 mm., of which the basal segment measures 5 mm., hind femur 8 mm., width of head 3 mm., of abdomen 2 mm.

Body very long and slender. Head about as long as wide, depressed and very flat above, with a prominent, angularly elevated and anteriorly directed tubercle behind each eye. Eyes small and situated at the midlateral margin of the head, and laterally prominent. Antennae very long, the basal segment densely pubescent and longer than the head is wide, the second segment one fourth as long as the first and the third to the seventh successively shorter and more slender. Labium very long and slender, the hinge reaching posteriorly to the metathorax; mentum with sides parallel in basal half, deeply and widely cleft in the greatly widened apical half into two slender lobes; these lobes are apposed at apex making an oval inclosure of the cleft; a pair of spinules, one each side, arise from the inner edges of the cleft at three-fourths its length. The lateral lobes are slender, with nearly parallel sides, the inner margin slightly convex and finely and doubly serrate, ending in a short arcuate end hook, that is separated by a deep cleft from two other larger similarly shaped hooks upon the end; above these hooks there is on the external margin the usual movable hook, which is larger and stouter and regularly arcuate; there is a pair of spinules on the lateral margin just before the base of the movable hook.

Legs very long and slender, each femur with a flattened prominence at the end upon its anterior face, that rests against the side of the tibia at its base, and is doubtless for leverage in these long legs. Wing cases reaching the middle of the 3d abdominal segment (young).

Abdomen cylindric, or very slightly tapering posteriorly, the lateral margins becoming prominent and spinulose on the 8th and 9th segments. Gills long, widest near the apex and suddenly tapering to the tips, spinulose margined, all slightly decurved, the middle one more

decidedly so, and becoming oblique at apex; lateral gills triquetral, the median, flatter and with a longitudinal carina upon either face.

General color yellowish green; some narrow longitudinal streaks and minute spots in pairs on the top of the head, and a broad black band extends from the base of the antenna to the thorax, including the eye. There are indications of paler transverse bands upon the gills and of subapical rings on the femora.

This species differs markedly from those hitherto known* in the form of the middle caudal gill-lamella, its greater brevity and apical widening and obliquity being very noticeable.

Anisopleura comes Hagen (supposition). (Plate V, figs. 1-3.)

Hagen, C. R., Soc. Ent. Belg., Vol. 23, p. lxvi, 1880, "*Euphaea dispar*?"

Carleton, M. C. Z., No. 301, India.

Length 21 mm., gills 9 mm. additional, abdomen 11 mm., hind femur 5 mm., width of head 5 mm., of abdomen 4 mm.

Body rather stout. Coloration lost, owing to action of alcohol. Antennae rather stout, 7-jointed, the relative lengths of the segments being as 1:1:1.3:1.8:6:5. Mandibles conspicuously biramous, the outer branch about as large as the inner projecting forward at the sides of the mouth outside as in generalized members of the Ephemerinae. Labium very similar to that of *Bayadera* shown in fig. 6 of plate V. Its lateral lobe differing slightly in the proportions of the end hooks, fig. 3.

Legs stout, thinly fringed with hairs along the superior longitudinal carinae. Wing-cases reaching the middle of the 5th abdominal segment. Abdomen slowly tapering posteriorly, bearing simple paired filamentous gills at the sides of the 2nd to the 8th segments. Caudal gills (middle one wanting) inflated at base with a ciliate superior carina, tapering to a long slender tail-like apex nearly as long as the swollen basal part and clothed with long soft hairs.

The only clue to the identity of this nymph is found in the venation of the developing wings, which are, unfortunately, but poorly preserved. These things are evident. Ante- and post-nodals in the fore wing are 14 and 16 respectively, and

*Dr. Fr. Ris has recently characterized the nymphs of the two commonest European species (Die Süßwasser-fauna Deutschlands, p. 47, 1909) and I distinguished two of the commonest N. American forms in 1903 (Bull. 68 N. Y. State Museum, P. p. 222). This is the fifth species of *Calopteryx* nymphs to be made known.

the latter in the hind wing are of about the same number. There are five or six cross veins behind the stigma, with no brace vein, nor any apparent furcation of vein R_1 at its inner end. Quadrangle and sub-quadrangle of the hind wing are without cross veins, and the wing ceases to be petiolate (i. e., the anal vein separates itself from the anal margin) at the third cross vein before the sub-quadrangle.

Bayadera indica (Plate V, figs. 4-7.) Hagen, C. R., Soc. Ent. Belg., Vol. 23, p. lxvi, 1880, "*Anisopleura comes?*"

M. C. Z., No. 300, "India, Carleton."

The nymph measures in length 22 mm., abdomen 12 mm., hind femur 5.5 mm., width of head 5.5 mm., of abdomen 4 mm., gills 6 mm.

Body rather stout, moderately depressed. Head widest across the eyes, the hind angles rather large, well rounded, scurfy hairy, and between them there is a strong concavity of the hind margin. Antennae 7-jointed: ratio of length of segments from base outwards is as 1:1.5:2.2:1.5:1.2:1:7. Frons slightly convex, covered with prickly granulations, its front border, and likewise that of the labium somewhat denticulate. Mandibles obscurely biramous, the outer branch a broad lateral prominence armed externally with four prominent sharp and strong, anteriorly directed teeth. Labium short and broad, the hinge reaching posteriorly to the middle of the prothorax. Lateral borders of the mentum serrate in the middle, the median lobe well rounded, with a narrow, closed median cleft: no raptorial setae: lateral lobes short and narrow, with finely denticulate inner margin that ends in a truncate prominence scarcely forming an end hook, and above which are two sharp incurved hooks on the distal margin, the lower one the larger. Movable hook stout, arcuate.

Prothorax almost as wide as the head, the lateral margins of its dorsal shield spinous. Legs short and thinly hairy. Tarsi 3-3-3-jointed, with a minute plantula between the claws. Wing cases extend posteriorly to the apex of the 5th abdominal segment.

Abdomen stout, with conspicuous lateral gills on segments 2-8, one pair on each segment, simple, filiform-conic, constricted at the base, each except the 8th longer than the width of its segment. Segment 10 dorsally excavate behind. Caudal gills three, thick, inflated at base and scarcely triquetral, scantily pubescent, contracted at base, widest before the middle, and suddenly constricted, and tapering in their apical fourth to an acute point.

An examination of fore and hind wing of one specimen re-

vealed the venation poorly preserved in the basal part, but well enough preserved in the outer two-thirds to show the points of origin of sectors, the number of included cell rows, the points of doubling of the rows. I made careful comparison with the wings of adult *Bayadera indica* from the same locality, and found such close likeness in every part as to leave scant doubt as to the species and none at all as to the genus. Ante- and post-nodals in the fore wing were 24 and 21 respectively and the cross veins behind the stigma were, in fore and hind wing, 5 and 6 respectively.

In examining the costal region of the hind wing I noticed that the outer edge of it was thinly clothed with intermingled hairs and flat scales.

At the middle of the inner face of the mandible in this species there is a tooth surrounded in part by thin membrane at its base and perhaps more or less movable, comparable to the articulated appendage to be described in the next species following.

Unknown nymph from Jamaica (Pl. IV, figs. 8-12).

A few immature nymphs from Wag-water River, Jamaica, Mar. 7 and 10, '77., M. C. Z., 329 and 322.

Length 15 mm., abdomen 9 mm., gills 5 mm.; width of head 2.5 mm., of abdomen 2 mm.

Body rather stout, somewhat depressed. Head squarish, the hind angles a little less prominent than are the eyes at the midlateral margins. Hind margin concave between the obtuse hind angles. Top of head very flat. Frontal ridge, border of labrum and external lobe of the mandible finely denticulate. Antennae 7-jointed, the segments from base outward being as to length in the following ratio: 1:3:2:1.5:1.2:1:6. Labium as in *Bayadera*.

Thorax depressed. Legs short, stout, thinly hairy. Wing cases reaching (in these immature specimens) only to the middle of the third abdominal segment.

Abdomen cylindric, or very slightly tapering, the first and tenth segments somewhat shorter than the intermediate segments. No lateral gills: caudal gills three, each cylindric or somewhat inflated in its basal three-fifths, scarcely triquetral, but with a thin marginal fringe of hairs, the apical two-fifths suddenly contracted and then tapering into a long hairy lash-like point.

There is a trapezoidal dark mark across the dorsum of abdominal segments 2-8 or 2-9, narrowly divided on the median line; and there is a row of)-or (- marks, either side, concave externally.

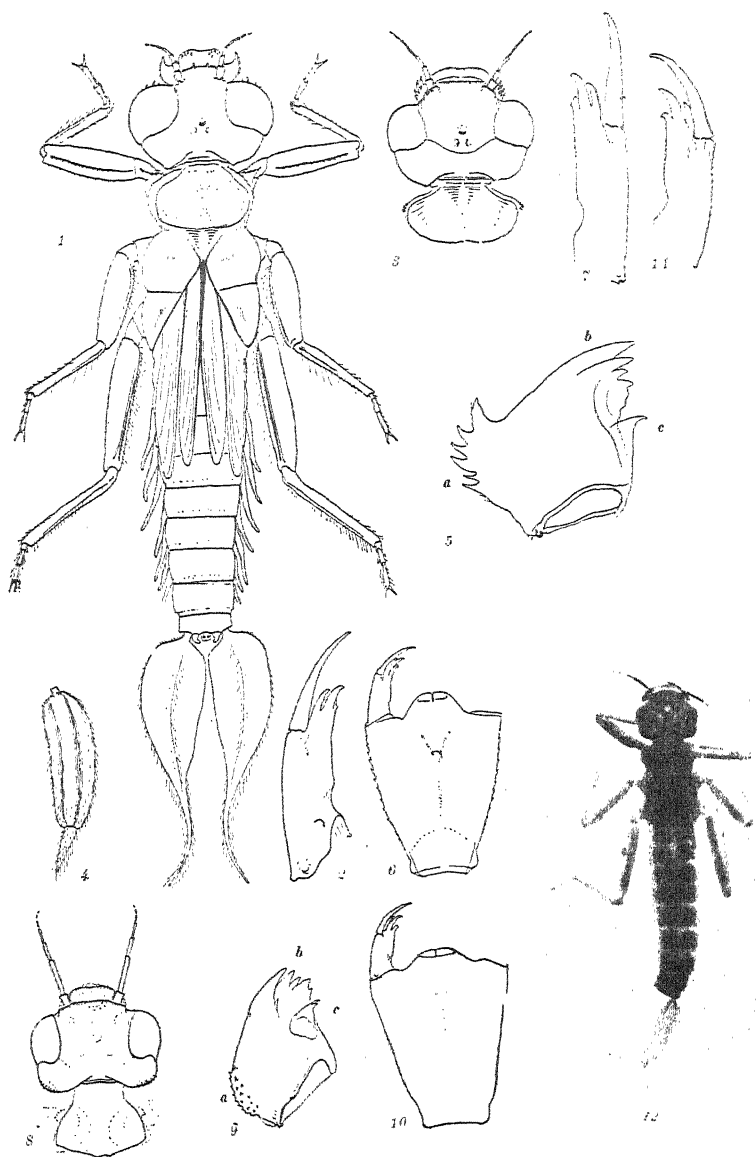
Mandibles short and thick, not biramous, but with a spinous tubercle standing in the place of the outer ramus, and with a bifid palp-like movable tooth upon the middle of the inner face.

This nymph while agreeing in many respects with the two preceding, differs markedly in the absence of lateral abdominal gills and of mandibular tusk; also in the sharpness of the construction of the middle of the caudal gills dividing them as if two-jointed and the greater length of the second antennal segment.

There is no known Jamaican Calopterygine with which this nymph can be associated. The imperfectly preserved venation of one specimen shows that quadrangle and subquadrangle are without cross veins. There are about 15 post-nodals, and there is no brace vein to the stigma. Vein M₂ arises a little beyond the nodus, and is closely parallel with the radial sector throughout a rather undulate course. All the long diagonal areas traversing the disc of the wing are occupied by single cell rows, and there is a sudden considerable apical divergence between veins Rs and M₃. In all these characters there is considerable resemblance to the Agrionine *Ortholestes*, but I cannot believe that a nymph so unlike all known Lestinae in labium, in gills and in stature is referable to that genus. It accords so well with *Bayadera*, *Diphlebia*, etc., that I prefer to believe there remains in Wagwater River, Jamaica, an undiscovered Calopterygine genus, with rather sparse venation.

As in the Anisoptera so in the Zygoptera, it is the form of the labium that furnishes the most constant and reliable characters for distinguishing the major groups. The presence or absence of lateral gills is of small moment, and the form of the caudal gills is unpredictable. Plate IV of this paper represents the group which in 1903* I recognized as a sub-family under the name Vestalinae; plate V represents another, that I

*A genealogic study of dragonfly wing venation. Proc. U. S. Nat. Mus., Vol. 26, p. 744.



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named Epallaginae. Surely the characters contrasted upon these two plates are sufficient to justify the separation of these two groups. Clearly the Epallaginae are the more primitive. Their biramous* mandibles and their lateral abdominal gills ally them with the sub-family Ephemerinae of Mayflies, and their venation is vastly more primitive than that of the Vestalinae.

Since the foregoing was written I have examined a nymph of still another Calopterygine genus from India—a single nymph from Simla Hills collected and sent me by Dr. N. Annandale. It is, unfortunately, a young nymph, perhaps about two-thirds grown (the wing tips reach only to the base of the third abdominal segment), with no venation showing, the specimen being near a moult, its wings crumpled within their sheaths. It is more elongate than *Bayadera* or *Anisopleura* with slenderer legs, and would be larger when grown (length of head and body in the present specimen 18 mm., gills 6 mm. additional.) It may perhaps belong to *Philoganga*. The inflated caudal gills are intermediate in character between those of *Bayadera* and *Anisopleura*, being more pointed than the one and less so than the other and being without constriction at the base of the attenuate apical portion. The mandible is also intermediate in the character of the external ramus, which is not quite simple, but nearly so, with only minute serratures upon its outer side—not a row of subequal teeth. The lateral abdominal gills are very similar in form, but they are decurved beneath the abdomen and scarcely visible from above. They occur, as in the others, on segments 2 to 8.

*The mandible of *Cora* is not biramous in the sense in which I have used the word in this paper: the outer ramus of the forms here described is wanting. The more or less movable piece upon the inner face of the mandible, perhaps a little better developed as a movable part in *Cora* than in any of those I have seen, apparently has no counterpart in the Ephemerine mandible, although there is rather regularly a movable palp-like piece situated at the base of the outer ramus of the mandible on its inner side in Mayfly nymphs.

EXPLANATION OF THE PLATES.

PLATE IV.

- Fig. 1.—The head and prothorax of *Neurobasis chinensis*?, from above.
Fig. 2.—End of labium of same, from within.
Fig. 3.—Lateral lobe of the same, from within.
Fig. 4.—End of abdomen, with caudal lamellae, from the side.
Fig. 5.—Head and prothorax of *Calopteryx angustipennis*?, from above.
Fig. 6.—End of labium of same, from within.
Fig. 7.—Lateral lobe of same, from within.
Fig. 8.—End of abdomen with caudal lamellae, from the side.

PLATE V.

- Fig. 1.—The nymph of *Anisopleura comes*?, middle gill wanting. The outer ramus of the mandible is exposed at the side of the mouth.
Fig. 2.—Lateral lobe of labium of the same.
Fig. 3.—Head and prothorax of *Bayadera indica*?, from above.
Fig. 4.—Lateral caudal gill of the same.
Fig. 5.—Mandible of same: *a*, external ramus; *b*, internal ramus; *c*, articulate tooth of the inner face.
Fig. 6.—End of labium of same, from within.
Fig. 7.—Lateral lobe of same from within.
Fig. 8.—Head and thorax of nymph from Jamaica, from above.
Fig. 9.—Mandible of same, from above. *a*, *b*, *c*, as in fig. 5.
Fig. 10.—End of labium of same, from within.
Fig. 11.—Lateral lobe of same, from within.
Fig. 12.—An unknown nymph from Jamaica.

The Stridulations of Some Eastern and Southern Crickets* (Orth.).

By H. A. ALLARD, U. S. Dept. Agric., Washington, D. C.

In all parts of our country musical species of crickets are more or less common. Although the notes of locusts and katydids are strident lisplings and raspings, the stridulations of nearly all crickets are characterized by true musical tones. These insects have become adapted to a wide range of en-

*The crickets mentioned in this paper have been identified through the kindness of Mr. A. N. Caudell of the U. S. National Museum, and all material collected has been added to the U. S. Museum collections in his charge.

vironmental conditions. The mole crickets (*Gryllotalpa*) dwell in subterranean burrows in wet soils. The numerous species of *Nemobius* and *Gryllus* are almost strictly terrestrial in their habits, preferring the grass and dry leaves of fields and pastures. In the low herbs and tangles of vines and shrubs dwell species of *Anaxipha*, *Phylloscirtus* and *Oecanthus*. In the foliage of the higher shrubs and trees may be found *Orocharis*, *Cyrtoxipha* and arboreal species of *Oecanthus*.

The notes of all crickets may be classed as either intermittent or prolonged. The intermittent "singers" include all species which chirp or trill briefly, as *Oecanthus niveus*, *O. angustipennis*, *Cyrtoxipha columbiana* and many others. The prolonged trillers are always recognized by their uninterrupted trillings which may continue indefinitely without pause. *Oecanthus latipennis*, *O. nigricornis*, *Phylloscirtus pulchellus*, *Anaxipha exigua* and many others have the prolonged trilling habit.

The habits, range and stridulations of many of our crickets are almost entirely unknown. More careful collecting, especially throughout the South, will probably add a number of new species to our fauna and, at the same time, greatly extend the range of many other little known species. Casual collecting in Northern Georgia by the writer has brought to light in this region a number of little known species of locusts and crickets. By his discovery of *Cyrtoxipha columbiana* and *Orchelimum minor* in Northern Georgia the known range of these insects has been extended six or seven hundred miles farther southward. Likewise, the writer's records of *Nemobius ambitiosus* in Northern Georgia extend the range of this interesting cricket about 250 miles northward into the upper piedmont belt.

Miogryllus saussurii, Scudd. The writer first met this cricket at Thompson's Mills, Georgia, late in July 1910. It is a ground-dwelling species, and keeps itself well concealed beneath the matted leaves and grass of gardens and orchards. It is very irregular in its distribution at Thompson's Mills and

appears to be more or less solitary in its habits. The writer heard it most frequently in a peach orchard near the settlement and also beneath the soil and leaves in a garden. Its notes are very brief, high-pitched musical trills, tzeee-tzeee-tzeee with brief intermissions. One individual delivered from 38 to 39 trills in a minute. This cricket may be heard in stridulation very early in the morning and more or less throughout the day and at night. It is rather difficult to locate and capture one of these crickets by its notes, for these are quickly silenced by one's approach. It is usually found beneath clods of earth, matted leaves, flat stones and boards. This cricket is very lively, and if uncovered leaps about vigorously. Its light brown coloration makes it very inconspicuous among the similarly colored leaves and soil. This species does not appear to be especially common at Thompson's Mills. It is first heard in midsummer.

Nemobius ambitiosus, Scudd. The writer first captured this little cricket at Thompson's Mills, Ga., early in April, 1910, although he had heard its stridulations one or two years before in the same locality. This pretty *Nemobius* is the first species to appear at Thompson's Mills and dwells among leaves in deciduous woods. This cricket is especially common on a warm, heavily wooded slope bordering a small brook just east of the settlement. Its trill is very brief, high-pitched and shrill, tiiiiiii-tiiiiii-tiiiiiii-tiiiiiii. Late in July the writer also met with small colonies of this cricket in other localities around Thompson's Mills. It is one of the commonest species of *Nemobius* in this vicinity and begins to stridulate as soon as spring opens in March and April. In April 1910 very cold periods of weather with considerable sleet and snow completely silenced these hardy crickets. Notwithstanding this inclement weather these crickets were always in active stridulation as soon as the days became warmer. Rehn and Hebard have said of this *Nemobius* in Southern Georgia: "The sound produced by the males is quite different from that of any other species, but it would be indeed impossible to describe the pitch which makes it so."

The range of this *Nemobius* extends practically all over Florida, since Rehn and Hebard report it from Leon County, Orange County, Duval County, Volusia County, Hillsboro County, Dade County, and other points.* In Georgia it has been found by Hebard and Rehn at Thomasville, southern Georgia, and by the writer at Thompson's Mills, northern Georgia, which is the second record of *Nemobius ambitiosus* in this State.

A very common *Nemobius* around Washington, D. C., in autumn is *Nemobius janus* Kirby. This *Nemobius* is usually found in the grass and leaves of damp soils by the roadside and in fields. In such situations, if flat rocks are present, numbers of the males and females find shelter beneath these. The note of *Nemobius janus* is a weak, low-pitched, prolonged trill, almost indistinguishable from the trill of *Nemobius palustris* of New England, except possibly a little louder. Around Washington this cricket continues to trill until December, if the weather is mild.

Gryllus pennsylvanicus var. *abbreviatus* Serville, also occurs around Washington. Not infrequently it takes up its quarters in the house, announcing its presence by its stridulations, which are intermittent chirps, possibly louder than the chirp of *Gryllus pennsylvanicus*.

Gryllodes sigillatus Walker. This cricket is exceedingly common at times in the greenhouses of the U. S. Department of Agriculture at Washington, D. C. This cricket is distributed throughout the tropical region of both the Eastern and Western Hemispheres, but has been rather widely introduced into colder regions where artificial tropical conditions are approximated, as in many greenhouses. This cricket is a very persistent singer. Its stridulations are rather shrill, brief chirps, so rapidly delivered as to produce an almost continuous trill. The notes, though louder, recall the notes of a *Nemobius*.

*See the following papers by Rehn and Hebard, both in *Proceedings of the Academy of Natural Sciences, Philadelphia*. "The Orthoptera of Thomas County, Georgia, and Leon County, Florida," Vol. LVI, 1904. "Orthoptera of Northern Florida," Vol. LIX, 1907.

Some Remarks on Kirby's Synonymic Catalogue of Orthoptera, Vol. III, with Additional Notes on Vols. I and II.

By A. N. CAUDELL, of the Bureau of Entom., U. S. Dept. Agric., Washington, D. C.

Having reviewed the first two volumes of this excellent work,¹ I now wish to present some critical notes on the third volume. Most of the notes here made pertain to North American forms. Some miscellaneous notes on volumes I and II, additional to my former review of those two volumes, are appended.

P. 4.—Mr. Kirby has overlooked the fact that *Phyllotettix* Hancock is a synonym of *Choriphyllum* Serville.² That this is true, however, there can be no doubt and the species listed under *Phyllotettix* by Kirby should be catalogued under *Zaphyllonotum* Caudell while the genus *Phyllotettix* and its equivalent *Phyllonotus* Hancock should be listed in synonymy under *Choriphyllum* Serville.

P. 48.—*Acrydium abbreviatus* Morse is listed as a synonym of *hancocki*. It is really a variety well worthy of a name. The same is true of *affinis* Hancock and *costatus* Hancock, which are varieties respectively of *crassum* Morse and *arenosum* Burmeister. As a matter of fact but few varieties are listed by Kirby other than as synonyms of the species of which they are really varieties.

P. 50.—*Telmatettix burri* Hancock is here catalogued as a species of *Hedetettix* but the describer of the species has shown it to be a synonym of *Paratettix scaber*.³

P. 59—Here Mr. Kirby has entered a *Tettigidea gracilis* Scudder. This seems to be an error as no such species appears to have ever been described, no name *gracilis*, either new or otherwise, appearing at the reference cited by Kirby. Thus

¹ Proc. Ent. Soc. Wash., vol. vii, p. 84-88 (1905); Can. Ent., vol. xl, p. 287-292 (1907).

² Caudell, Proc. Ent. Soc. Wash., vol. xi, p. 113 (1909).

³ Trans. Ent. Soc. Lond., p. 410 (1909).

the name *gracilis* of Bruner is not shown to be preoccupied and the name *exigua*, which is proposed by Kirby, p. 58, to replace it, is unnecessary and falls into synonymy under the name it was proposed to replace.

P. 87.—*Taxiarchus septentrionalis* was described by Bruner, not by Rehn as here listed.

P. 104.—The *Truxalis angusticornis* of Stal is a synonym of *Dichromorpha viridis*. It is correctly listed on page 125.

P. 105.—Prof. Bruner's paper in Proc. U. S. Nat. Museum, Vol. XXX, p. 613-694 was published June 5, 1906, not in February as quoted by Kirby. Thus Bruner's *H. lamellipes* should be listed in synonymy under *Hasinus* Rehn, which was described in May of the same year, giving it precedence by a month over Bruner's species.

P. 107.—The species *enslavac* and *valida* of Rehn are referred to *Syrbula* without question by Rehn and Bruner.

P. 108.—The *Pedioscirtetes pulchella* of Bruner has been referred to the genus *Acrocara* for the last twenty years.

P. 109.—*Acrocara maculipennis* is found in the United States, having been recorded from Arizona by Rehn and Snow. Specimens from that state are in the United States National Museum.

P. 110.—The genus *Gymnes* of Scudder is a synonym of *Boottettix* Bruner as first suggested by Bruner⁴ and later definitely established by Caudell.⁵

P. 112.—*Eupedetes* is a synonym of *Eritettix* and *Eupedetes carinatus* Scudder is a synonym of *Eritettix variabilis* Bruner.⁶

P. 115.—The *Stenobothrus subconspersa* of Walker is very likely a synonym of *Amblytropidia occidentalis* Saussure.

P. 118.—*Oeonomus* Scudder is a synonym of *Napaia* McNeill and *Oeonomus altus* is a synonym of *Napaia gracilis* Bruner.⁷

P. 122.—Kirby omits *Orphulella losamatensis* Caudell, Proc.

⁴ Biol. Cent.-Amer., Orth., vol. ii, p. 52 (1904).

⁵ Proc. U. S. Nat. Mus., vol. xxxiv, p. 73 (1908).

⁶ Rehn, Proc. Acad. Nat. Sci. Philad., vol. lix, p. 331 (1907).

⁷ Biol. Cent.-Amer., Orth., vol. ii, p. 90 (1904).

Ent. Soc. Wash., Vol. XI, p. 113 (1909), a specific name proposed to replace the *walkeri* of Bruner, 1906 which was shown to be preoccupied by the *O. walkeri* of the same author proposed in 1904. Mr. Kirby erroneously lists this later *walkeri* under the date of 1904 and quotes it, together with the *walkeri* of 1904, in synonymy under *punctata* DeGeer. The later described *walkeri*, that of 1906, has nothing to do with the one of 1904. It is a distinct species for which the name *losam-atensis* will have to be used.

P. 125.—*Dichromorpha brunnea* Scudder is a color variety of *Dichromorpha viridis*, not a distinct species as here listed.

P. 127.—*Fenestra* cannot be credited to Brunner as it was used by him in an invalid manner, having no species connected with it.⁸ The first writer to validate this genus by referring to it a valid species was Giglio-Tos⁹ who referred to it the single new species *bohlsii*, which is therefore the type. The genus *Dichroattix* of Bruner, based upon the single species *viridifrons*, is a synonym of *Fenestra* Giglio-Tos, its type being synonymous with that of *Fenestra* as pointed out by Rehn.¹⁰

Mr. Rehn was perfectly correct in replacing the genus *Fenestra* as used by Bruner in 1900 by the new name *Coccyto-tettix* and this genus should be used for the species listed by Kirby under *Fenestra*: these are *pulchripennis*, *intermedia*, and *argentina* of Bruner and *linearis* of Rehn.

P. 128.—*Coloradella* was established by Bruner in 1893 but was invalid, having no included species. The next use of the name was by Bruner¹¹ who questionably referred to it the *Stenobothrus brunneus* of Thomas. This species, being a questionably included one, cannot become a geno type according to commonly accepted usages of nomenclature and thus

⁸ Such genera are quite generally considered by entomologists as *nomina nuda*. This is certainly the only satisfactory way of treating such genera.

⁹ Zool. Jahrb., vol. viii, p. 807 (1895).

¹⁰ Proc. Acad. Nat. Sci. Philad., p. 31 (1906).

¹¹ Ann. Rept. Nebr. Board of Agric., 1896, p. 129 (1897).

the genus is yet invalid. Now Mr. Kirby uses the genus and includes one species which he calls *Coloradella brunnea* Bruner, giving as the original reference the place where Bruner questionably referred Thomas' *brunneus* to the genus, apparently considering that Bruner misidentified Thomas' species. But misidentifications should not be perpetuated as distinct names and besides a misidentification on Bruner's part is not evident. Bruner never having described such a species there is no *Coloradella brunnea* Bruner and therefore the generic name *Coloradella* is still invalid.

P. 129.—*Psoloessa buddiana*, *ferruginea* and *maculipennis* are synonyms of *P. texana*.¹²

P. 130.—*Stirapleura mescalero* Rehn belongs to the genus *Psoloessa* and as a synonym of *texensis*.¹³

P. 134.—*Scyllina calida* Bruner has been recorded from Arizona.¹⁴

P. 135.—*Ageneotettix arenosus* Hancock is a synonym of *A. scudderii*.¹⁵

P. 135.—The genus *Aulocara* is, by nearly all essential characters, Oedipodiiian as shown by the writer some years ago.¹⁶

P. 159.—*Gomphocerus clepsydra* and *carpenteri* are synonyms of *clavatus*.

P. 166.—*Staurorhectus glaucipes* Rehn has been removed to the genus *Amblyscapheus* and *A. lineatus* Bruner falls into synonymy under this species, *glaucipes* being the older by a month.¹⁷

P. 172.—The *Stethcophyma doranii* of Goadling has long since been sunk in synonymy under *Chortophaga viridifasciata* DeGeer.

¹² Rehn & Hebard, Proc. Acad. Nat. Sci. Philad., p. 381 (1908); id, p. 144 (1909).

¹³ Rehn & Hebard, Proc. Acad. Nat. Sci. Philad., p. 145, foot-note (1909).

¹⁴ Rehn, Proc. Acad. Nat. Sci., Philad., p. 34, 71 (1907).

¹⁵ Hart, Bull. Ill. State Lab. Nat. Hist., vol. vii, p. 259 (1907).

¹⁶ Caudell, Can. Ent., vol. xxxv, p. 302 (1903).

¹⁷ Rehn, Proc. Acad. Nat. Sci. Philad., p. 167 (1907).

P. 188.—*Chorthippus coloradensis* McNeill is a synonym of *C. curtippennis* Harris.¹⁸

P. 188.—*Stenobothrus occipitalis* Thomas has long been referred to the genus *Cordillacris* (*Alpha*). It is correctly entered on p. 116.

P. 188.—*Stenobothrus olivaceus* Morse has long been referred to the genus *Cordillacris* (= *Alpha*). It is correctly p. 119.

P. 195.—Records of *Arphia fallax* from Florida are probably mistakes, the locality intended probably being Mexico.

P. 196.—*Arphia teporata* is a synonym of *A. arcta*.

P. 198.—*Arphia hesperiphila* Rehn is a *Lactista* and a synonym of *Lactista gibbosa* Saussure.¹⁹ It is correctly entered on p. 236.

P. 198.—The *Oedipoda differentiale* here listed is only a reference under this name by Riley to the common *Melanoplus differentialis*.

P. 204.—*Hippiscus sierra* Rehn belongs to the genus *Xanthippus* if that genus is to be used. In the writer's opinion the characters used for the differentiation of *Stictippus*, *Cratypedes*, *Xanthippus* and *Pardolophora*, while useful in separating species, are not of generic value. The retention of these groups as subgenera is not to be encouraged as the tendency is, at least in Orthoptera, to either suppress subgenera or raise them to generic rank.

P. 205.—The generic name *Cratypedes* was first put into print by Scudder²⁰ but was used in an invalid manner, having included only an undescribed species. The next writer to use the name was Thomas²¹ who validated it by describing under it a new species, *C. putnami*. Thus the genus is creditable to Thomas but it is a synonym of *Xanthippus* Saussure and both of these genera, in the reviewer's opinion as stated above, should be sunk under *Hippiscus* Saussure.

¹⁸ Bruner, Biol. Cent.-Amer., Orth., vol. ii, p. 92 (1904).

¹⁹ Bruner, Biol. Cent.-Amer., Orth., vol. ii, p. 168 (1905).

²⁰ Bull. U. S. Geol. Surv. Terr., vol. ii, p. 267 (1876).

²¹ Proc. Davenport Acad. Nat. Sci., vol. i, p. 257 (1876).

P. 216.—The type of *Chloeбора* Saussure is given as species No. 6 while but four species are listed, a good illustration of this unsatisfactory method of type citation. *Ch. grossa* may be taken as the type of *Chloeбора*.

P. 234.—The *Oedipoda belfragii* of Stal is best sunk definitely in synonymy under *Spharagemon aequale* as has been done questionably for over a decade. Likewise the *Dissosteira texensis* of Saussure is best disposed of definitely in synonymy under *Spharagemon aequale* as Morse did questionably in 1895.²² Bruner²³ quotes this species as a probable synonym of *Spharagemon cristatum*, but the original diagnosis does not seem to justify this, the relationship being more clearly with *aequale*.

P. 236.—Mr. Kirby has here, species No. 3, confused two distinct species. The species described by Bruner in 1889 as *Oedipoda* (?) *occidentalis* is a species of *Circotettix* while the *Scirtettica occidentalis* of the same author described four years later is a quite different species and is a true *Scirtettica*.

P. 238.—*Lactista boscanus* Rehn is a synonym of *Tomonotus astecus* as shown by Bruner²⁴ and admitted by Rehn.²⁵

P. 244.—*Dcrotmema lentiginosum* Scudder belongs to the genus *Trimerotropis* and is a synonym of *T. gracilis*.²⁶

P. 249.—*Oedipoda kiowa* Thomas belongs to the genus *Trachyrhachys*, not to *Trepidulpus* as here listed. The same is true of *Mestobregma pulchella* Bruner.

P. 251.—*Psinidia amplicornis* Caudell is a true *Psinidia*.

Conozoa melleola Scudder is a species of *Trepidulus*.

Agonozoa McNeill, as shown by Rehn²⁷ is a synonym of *Trimerotropis* s. s. *Trimerotropis texana* Bruner may be considered as the type of *Agonozoa*.

P. 255.—*Pseudotrimerotropis* Rehn, of which *Trimerotropis*

²² Psyche, vol. vii, p. 293 (1895).

²³ Biol. Cent.-Amer., Orth., vol. vii, p. 166 (1905).

²⁴ Biol. Cent.-Amer., Orth., vol. ii, p. 169 (1905).

²⁵ Proc. Acad. Nat. Sci. Philad., p. 149 (1909).

²⁶ Caudell, Proc. Ent. Soc. Wash., vol. xi, p. 113 (1909).

²⁷ Rehn, Trans. Amer. Ent. Soc., vol. xxvii, p. 334 (1901).

vinculata Scudder may be taken as type, is based upon characters which are not, in the reviewer's opinion, of generic importance and the genus should be sunk in synonymy under *Trimerotropis*.*

P. 263.—*Hadrotettix mundus* Scudder belongs to the genus *Trimerotropis*.²⁸

Hadrotettix gracilis Bruner was a nomen nudum until it was validated by Bruner in 1897. It is now referred to the genus *Trimerotropis* where it is preoccupied and is replaced by *Trimerotropis bruneri* McNeill, a name proposed for that purpose.

P. 278.—The *Oedipoda venusta* of Stal has long been located in the genus *Spharagemon*. It is a common Pacific coast species.

P. 341.—Here is another example of the ill working of type citation by number, the type of *Charilaus* Stal being given as No. 4, while but three species are catalogued. *C. carinatus* Stal is the type species.

P. 369.—The use of the emended form *Rhomalea* instead of *Romalea* as originally spelled is not in accordance with the laws bearing upon such matters.

P. 370.—The *Romalea gloveri* here introduced is but a color variety of *Romalea microptera*.

P. 370.—The locality California under *Litoscirtus insularis* should be Lower California.

P. 434.—*Ommatolampis brevipennis* Thomas is a species of *Hesperotettix*. It is correctly entered on p. 499.

P. 461.—*Acridium ambigua* Thomas is a synonym of *Schistocerca americana* Drury.

P. 462.—*Acridium frontalis* Thomas is a synonym of *Hesperotettix speciosus* Scudder. It is correctly entered on p. 500.

[*The name *Pseudotrimerotropis* was proposed to replace the restricted *Trimerotropis* of McNeill, true *Trimerotropis* being equal to his *Agonozoa*. The author of the name has never considered it of more than subgeneric rank. (J. A. G. R.)]

²⁸ Caudell, Proc. Ent. Soc. Wash., vol. xi, p. 112 (1909).

P. 462.—*Acridium milberti* Serville has long been placed in synonymy under *Melanoplus femoratus* Burmeister.

P. 468.—*Sauracris locusta* is a misspelling for *S. lacerta*.

P. 493.—The *Pezotettix humphreysii* of Thomas is a species of *Melanoplus*.

P. 500.—The type of *Aeoloplus* Scudder is, by original designation, *Caloptenus regalis* Dodge,* not *Caloptenus turnbulli* Thomas as here stated.

P. 507.—Scudder's Revision of the Melanopli in Proc. U. S. Nat. Mus., vol. xx, quoted by Kirby under the various genera of this group as 1898 was really published December 28, 1897, as stated in the list of papers in the completed and bound volume of that publication.

P. 507.—The species *bruneri* Caudell here listed in the genus *Asemoplus* is catalogued wrongly, its proper position being in the genus *Aeoloplus*.

P. 542.—*Pezotettix flavoannulatum* LaMunyon is a synonym of *Dactylotum pictum* Thomas. *Dactylotum picturatum* Bruner is to be used for the purpose for which it was erected, that is to replace the preoccupied *pictum* of Gerstaecker. *Dactylotum longipenne* Townsend is a *Poecilotettix* and a synonym of *P. sanguineus* Scudder and replaces that name, being the older and properly established. The synonymy of these species was first indicated by Bruner,²⁰ but he used Scudder's name, wrongly considering *longipennis* as a MSS name.

Additional notes on Vol. I.

The genus *Photina* is duplicated, appearing on p. 257 and again on p. 273. The first reference should be eliminated.

The types of *Hestiasula* Saussure, *Harpagomantis* Kirby and *Menexenus* Stal, like all the genera in this catalogue, are indicated by number and, as so often the case, the number quoted as that of the type species is greater than the number of species included. Error is evident.

²⁰ Biol. Cent.-Amer., Orth., vol. ii, p. 329 (1908).

[*This should be *Aeoloplus regalis* Scudder, not *Caloptenus regalis* Dodge, which Bruner has shown to be a *Melanoplus*. The *regalis* of Scudder has been renamed *bruneri* by Caudell. (J. A. G. R.)]

Additional notes on Vol. II.

The genus *Ephippigera* of Serville seems properly established and should be used in place of *Ephippigerida* Buysson. *Ephippigera* was first proposed by Latreille in 1825 but lacked validity, having no species included in it. Serville validated the name in 1831 by including under it several valid species.

Orocharis terebrans Saussure & Zehntner³⁰ was omitted from the catalogue.

The genus *Platyxyphus* of Walker is properly established, being the raising of Haan's species *platyxyphus* to generic rank. The genus is valid, in spite of Walker's apparent haziness regarding the matter, and the type is *Gryllus platyxyphus* Haan. This genus antedates and replaces the genus *Pteroplistes* of Brunner and the three species listed under that genus should be catalogued under *Platyxyphus*, and *Pteroplistes* sunk in synonymy under that genus.

Pseudonemobius Saussure, p. 13 of Kirby, should be used in place of *Paranemobius* as this last name is an error and is corrected in the list of errors in the back of the work in which it is made. Besides the name *Paranemobius* is a *nomen nudum*, occurring only in a table of genera and without citation of described species. *Paranemobius* was, however, given standing by Bolivar in 1900 and thus preoccupies the *Paranemobius* of Alfken described in 1901. Kirby has replaced Alfken's genus by *Caconemobius*.

Gryllus lineaticeps Walker, 1869, is preoccupied by *Gryllus lineaticeps* Stal, 1858. Walker's type is apparently lost as it is not marked as present in the British Museum. A new name for it is needed if it is to remain in our lists as a valid species, but, owing to its doubtful status, I think it best to consider it eligible for listing only as an unrecognizable species.

Pterolepis caucasica Fischer is listed on p. 180 under the genus *Paradrymadusa* and on p. 199 under the genus *Pholidoptera*. The former is the proper disposition.

The genus *Thliboscelus* of Serville was established with a single included species, the *Locusta camellifolia* of Fabricius.

³⁰ Biol. Cent.-Amer., Orth., vol. i. p. 277 (1897)

That species is therefore the type of the genus. That Serville misidentified Fabricius' species does not alter this fact according to sound nomenclatural reasoning. Thus *Thliboscelus* falls as a synonym of *Pterophylla* Kirby & Spence, both genera being based upon the same species. The Brazilian insect wrongly considered as the *camellifolia* by Serville without a name as a mere identification is not to be perpetuated as a distinct species, though Kirby, p. 345, has followed Brunner, Monogr. Pseudoph., p. 148, in doing so in this case. I propose the specific name *brasiliensis* for this insect and refer both it and the *Cyrtophyllus crepitans* of Redtenbacher to the genus *Pterophylla*, considering neither generically distinct from the other members of that genus.

The Male of the Black Scale (*Saissetia oleae* Bern.) (Hemip.).

By H. J. QUAYLE, Berkeley, Cal.

While the black scale (*Saissetia oleae* Bern.) is very widely distributed over the world, little has been known and practically nothing published about the male. It was first described by Dr. B. W. Griffith, of Los Angeles, in 1893. It was then said to be limited to a small area in the vicinity of Los Angeles, California. During the past year or two we have taken it at various places in the citrus belt from Santa Barbara to San Diego. It seemed to be especially abundant during the season of 1909. In places where it occurred that year, it was not nearly so abundant in the previous year or the year following. As many as ninety-seven puparia, from all of which males had emerged, have been seen on a single orange leaf. The males have been taken from the leaves of orange, oleander, pepper and olive. They emerged during the months of June, July, August, September, October, November, December, January and possibly other months, though not yet observed.

The Second Stage Male. Up to the time of the first moult there is no difference between the sexes. After the first moult

the male becomes decidedly more elongate, resembling more nearly a partly grown soft brown scale. Its length is 1.5 mm. and width .64. It is of a light brown color with the eyes visible in the latter part of the stage as small dark areas on the front margin. The anal plates together form a triangle with rounded corners, and from the tip of each of these there arises three or four small spines, and one large one on the central dorsal surface.

The length of time spent in this stage is about four weeks. During this time it is feeding and grows to about five times the length of the just-hatched larva. At the end of the stage a puparium is formed which completely covers the insect, although it is transparent and not so readily discernible.

The Male Puparium. This puparium is a glassy like covering that is formed from the secretion of numerous pores over the body surface of the insect. Its length is 1.5 mm. and width .5 mm. The surface is slightly roughened with a row of granular projections along the dorsal line. Two lines beginning at the anterior end converge upward for a short distance and then run more nearly parallel, with but a slight convergence toward the posterior end. Within this the surface is more convex, forming a ridge along the dorsal line. Not quite $\frac{1}{4}$ of the distance from the anterior end and at a point where the lines begin to run parallel, is a cross line or carina. Another lateral carina crosses this dorsal strip, or coronet, at $\frac{1}{4}$ the distance from the posterior end. Immediately posterior to this cross line are two spiracular channels extending to either margin. The other two spiracular channels, extending from the coronet to either side, are just before the middle line. There is a triangular opening for the anal plates and a cleft from this to the posterior end. Along the margin is a series of circular areas from which secretions extend to the surface of the leaf thus holding the puparium in place. When a puparium was removed 3 or 4 weeks after the male had emerged, these connecting threads were still capable of being stretched considerably as was observed upon lifting the puparium.

These are found usually on the under side of the leaves of the orange, pepper, olive and oleander, chiefly, since these constitute the principal foot plants of the scale. When the insect is still beneath it can be detected through this transparent covering. If it has not yet transformed to the propupa it occupies the entire space beneath extending well out to the mar-

gins, but in the case of the later stages the insect beneath is somewhat narrower. These puparia may remain on the leaves for months after the scale has emerged.

The second stage male is capable of moving up to the time the puparium is secreted, which is the preliminary step in the change to the propupa. But it is only rarely that any movement occurs in this stage and hence the males are nearly always found on the leaves where the young first settle.

The Propupa. Length 1.4 mm., greatest width .4 mm. Color light brown with red pigment scattered about particularly at posterior end; head reddish; eyes dark red or brown. Sheath of style short and blunt, on either side of the style are two more slender and pointed appendages, the cerci extending beyond the style. At the tip are a few short hairs or spines. The sheaths of the antennae and legs are scarcely visible on the dorsal surface, excepting a broadening, where these lie on the ventral margin. On the ventral side these are plainly visible and lie in close contact with the body.

The length of the prepupal period is from 5 to 8 days during the warmer weather.

The Pupa. Length 1.2 mm., width .4 mm., general color, same as that of propupa excepting that there is a larger amount of pigment at the anterior end. The head is entirely red. A marked constriction forms the neck, making the head appear as arrow-shaped. Eyes black. The wing pads are conspicuous and extend to 3rd abdominal segment. The style has increased in length so that it is slightly longer than the cerci on either side. The antennae, legs and wing pads, while naturally lying close to the body, are distinct and readily separated from it.

Eight to twelve days are spent in the true pupal stage when it changes to the adult. In all the moults after the second stage the skin is split at the anterior end and pushed back beyond the puparium.

The Adult Male.—The fully developed male remains from one to three days beneath the puparium before emerging. The adult stage can be determined without the removal of the puparium by the appearance of the long white caudal filaments which project out beyond the tip of the puparium. The life of the adult male is from one to four days. The following description of the male is copied from the notes of Prof. R. W. Doane, who worked with the writer during the summer of 1910.

Length exclusive of style 1 mm.; style .4 mm.; caudal filament .8 mm.; antennae .5 mm.; wing 1 mm. long, .5 mm. wide; honey yellow; head darker yellow; anterior pair of upper eyes dark red, posterior pair black, smaller; ventral pair black equal in size to the upper anterior pair. Antennae whitish, 10-jointed, first joint short, thick cylindrical; second joint about equal to first but oval; third joint about as long as second but much more slender, slightly swollen toward the tip; remaining joints all slender, cylindrical, fourth as long as fifth and sixth together; others sub-equal in length, collar long, cylindrical; prothorax broad shield shaped; mesothorax more strongly chitinized and wholly brown except a yellow shield-shaped area above, between the bases of the wings; metathorax with a slight brownish tinge, legs brownish yellow; style yellow; caudal filaments white, slender, tapering, twice as long as style; wings hyaline with a yellowish tinge, with a microscopic close-set pubescence.

The above description is given in detail because the original description given by Dr. Griffith is incomplete. The only figures of the male that have appeared from original specimens are given by Marlatt in the U. S. D. A. year book for 1900. "In the figure of the adult there given the black bands are not properly placed. Both are too far forward, the first is not broad enough, the second too broad, and the yellowish spot between the wings does not reach to the base of the wings."—DOANE.

When the males emerge the females that hatched at the same time have completed their second moult and the letter H is evident. Summarizing the length of the life cycle of the male it will be during the summer months as follows: First stage, 1½ months; second stage, 1 month, propupa 8 days, pupa 10 days, adult 3 days. Total, 96 days, or about 3 months.

The "Crop" of Lepidoptera of 1910.

BY R. R. ROWLEY, Louisiana, Missouri.

The early part of the summer of 1910 was anything but encouraging to the collector of lepidopterous insects, barring the greater silk moths. There were no butterflies on the wing and no larvae on the food plants. True, the first sunny days of spring had warmed the chrysalids of *ajax* and *turnus* and a

few swallow tails were in the air and the papaws in full leaf but, alas, the frosts, sleet and snows of the latter half of April stripped the trees of their foliage and froze the larval life almost to extinction.

There was some compensation for these losses in the rather abundant appearance of *cecropia*, *luna* and *polyphemus*, but, all in all, the prospect was gloomy. Everything had to begin over again after April 25th; the trees to releaf and the hardier larvae to struggle through a starvation period, but the fruit was gone. We measure everything by the crop of fruit out here. Common as *ajax* usually is here all through the summer and as plentiful its eggs and larvae, there was a dearth of its every life stage till August. The even more plentiful *andria* was scarce throughout the entire season.

Not till July was there anything at the electric lights. Then the hawks began to come. The freeze that killed the earlier larval life also killed many of their enemies, for the later broods of caterpillars appeared in unusual numbers and fairly healthy, except the *Sphinx* larvae.

In August and September larvae were to be found everywhere. *Luna* and *regalis* on all their food plants, *imperialis* even more plentiful still, for all the shade trees yielded them and the sassafras. *Cecropia* was not so much in evidence, but *polyphemus* was abundant. Then, too, in August and throughout September the great *Papilio*s hovered over their food plants or settled in great bunches about the wet, sandy pool margins or the muddy roadside. From one small butter-nut tree, scarcely eight inches in diameter, thirteen larvae of *C. regalis* were taken, eight of them well grown, three on a small persimmon tree and others on sumach.

It was on an east hillside in an old abandoned field where the three of us, Harold Davenport, Virgil Smith and the author, spent a Saturday in September and came back laden with spoils. It was the 24th and a splendid day, and we had decided to make a picnic of it, but we forgot the lunch till it was time to quit the woods. The persimmon trees, the sassa-

fras bushes and the sumach, the hickories and the buck bushes were too alluring. We filled all our cans, boxes and paper bags with larvae. The hickories gave us *luna*, *juglandis* and *excaecatus*; the persimmons, *regalis* and *luna*, and the sassafras, *imperialis*, *troilus* and *crispata*. The buck bushes were alive with the larvae of *diffinis*.

The yield was four "hickory horned devils," four gigantic *imperialis*, eighteen *lunae*, two *juglandis*, one *excaecatus*, thirty *troilus*, fifty *diffinis*, five *Lagoa crispata*, and numbers of other "worms."

Elated with our success we spent the next day in the woods, but our selection of locality was unfortunate and we did poorly. We still found the larvae of *troilus*, *diffinis* and *luna* abundant, but the larger caterpillars were nearly wanting. We took two *imperialis* and eight *juglandis*, but we wandered over much territory. We were not herpetologizing, but we killed two gigantic copperheads on the hillside and the next day an equally gigantic spreadhead.

Throughout the days of late August we collected *regalis* larvae, and all through September, even to the 10th of October, we gathered up *imperialis* "worms."

Of the hawk moths the most abundant were *modesta*, *diffinis*, *excaecatus* and *geminatus*. *Hylacus* was not so abundant as usual, *pandorus* and *myron* larvae badly parasitized. At light, *drupiferarum*, *carolina*, *celeus*, *pandorus* and one *myops*, a rare moth here. Out of twelve eggs and twenty larvae of *Cressonia juglandis* collected during the summer, three moths and three chrysalids were obtained.

These larvae suffer terribly from the microgasters, and it is no wonder the species is so rare. Even in the absence of parasites, the larvae of *juglandis* seem delicate, for the author collected a number of fertile ova and freshly hatched caterpillars in early August, and every "worm" of them died before the third moult.

Of the few *geminatus* larvae picked up in September, all, save two, "broke out with parasitic cocoons" and the two later died, one even after pupation.

One day while hunting regal larvae the writer, much to his great delight, found two caterpillars of *Sphinx kalmiae* feeding in a low ash bush. One of them was attempting to cast his skin in the last moult but he was too weak and died. The other was later riddled by microgaster larvae.

A few larvae each of *Daremma undulosa* and *Ceratomia amyntor* succumbed to their internal enemies. It seems such a shame that the great caterpillars of our most beautiful moths should suffer so from foes so insignificant. This law of balance in nature probably means much to life in general and certainly to the vegetable world, but it is hard to convince the collector of larvae that his losses are payments to nature of any apparent indebtedness. That the delight which one experiences on finding some treasure of a larva should be turned to bitter disappointment in the claiming of this same treasure by some parasitic enemy is not much calculated to win an ardent admirer of this same so-called eternal fitness of things.

The author brought to pupation a fine colony of *Sphinx eremitus* larvae from eggs collected by Miss Lulu Berry, of Vinton, Iowa, feeding them through on common peppermint, although the eggs were found on the leaves of bugle weed. There was practically no loss in these larvae.

From eggs furnished by the same collector and found on the leaves of Enchanter's nightshade, the writer fed the larvae of *Amphion nesus* on wild grape and secured seven pupae.

A full grown larva of *Smerinthus excaecatus* was picked up under a maple tree on November 3d, after a number of frosts and several severe freezes. It fed on the yellowed leaves of soft maple, poplar and apple till November 29th, when it ceased eating and died. Of course, it was kept in a jar in the house by a fire.

The disappointment in the searches for *Papilio* larvae in the early part of summer was more than balanced by the abundant finds in August and September.

Harold Davenport handled more than two hundred eggs and larvae of *ajax* and obtained a goodly number of chrysalids

while Virgil Smith, Verner Pinkerton and the author collected a goodly number of *cresphontes* larvae.

Larvae of *turnus* were found on hop tree, prickly ash, plum, apple and ash, but not plentifully. No searches were made for *asterias* though the imagoes were not rare. As usual, from the scarcity of its food plant, *philenor*, even in the winged state was very scarce.

While feeding three larvae of *regalis* in a roomy breeding cage and with an overabundance of fresh leaves, the smallest caterpillar mysteriously disappeared nor could any trace of it be found. The cage was close and no possible show of escape, so the only conclusion as to its fate was that the larger two worms devoured it. Repeatedly has the author lost *Catocala* larvae in the same mysterious manner and Mr. Davenport reported similar losses among well grown larvae of several genera and species. Why caterpillars with an abundance of food should resort to cannibalism is inconceivable, and yet there is no other way to explain the disappearance of some of our "worms."

From over one hundred pupae of the first brood of *Triptogon modesta* (Rothschild and Jordan call this *Pachysphinx modesta*) quite seventy produced imagoes with crippled wings, although all chrysalids were on damp earth and strips of cloth hung down the sides of the cages. The freshly hatched imagoes all climbed up the cloth and yet with everything in their favor, they failed to mature. Thinking the trouble was caused by keeping the pupae together in the cages, they were separated so that one would emerge in a can or jar per night and still there was little improvement in the quality of the moths.

It is true there was a slight increase in the number of perfect moths after the separation of the chrysalids, but the trouble was not obviated. As a matter of fact there were a few more deformed females than males. Out of ten moths that emerged together, one night, there were but two perfect specimens. It is possible that this is another means that nature takes to check overproduction.

Out of two lots of eggs of the second brood of *modesta* (nearly two hundred eggs in all) but three chrysalids were secured, the larvae dying before the third moult. However, one lot of these eggs was from a female that mated with a male from the same parents.

Of the first brood, mentioned above, about a fifth failed to give imagoes with the rest and are holding over till next spring. Three imagoes that appeared fully a month after the rest, were very pale in color, while the first moth that emerged had an unusually red hind wing, in fact the wing was red all over.

From a half drowned female *Smerinthus cecaecatus* found floating on a tub of water after an all night's rain, one hundred and five eggs were obtained and from the larvae fed on apple, about fifty chrysalids secured. The losses were largely when the larvae were small. This is one of the hatches of larvae where cannibalism was apparent.

By far the most interesting larvae of the summer's work were the *Sphinx eremitus* "worms," so hardy and so grotesque with their dorsal hump and the black dorsal spot.

It is often asked if *Catocala* moths ever come to light like most other moths. It is generally denied that they do and yet twice this summer in early July the writer saw a *Catocala* on an electric light pole in the full glare of the light but too high to be reached. It is almost certain that the species was *ilia*.

Now that the summer is gone and the trees are stripped of their leaves, cocoon hunting is no mean sport but probably more interesting still is the search for *Catocala* eggs. A few boxes and a small chisel are the necessary paraphernalia and the loose outer bark and the cracks in the bark of hickory, walnut, white and bur oak, honey locust, willow, maple, plum and crab, are carefully searched for the small ova.

In our searches for cocoons on the shade maples we had to use long fishing poles with end hooks, and the fall on the pebbles of some of the *polyphemi* proved disastrous. Little or no trouble was experienced in collecting the *prometheae* as most of them were found dangling from the twigs of low

sassafras and persimmon bushes. Frank Caldwell reported eight cocoons of *promethea* from one sassafras, while the author took seven from a small bush. The remarkable likeness among the cocoons of *promethea*, *cynthia* and the gigantic *atlas* is rather surprising inasmuch as all three belong to different genera. The caterpillar of each of these moths spins an elongate cocoon inside a single leaf securely fastened to the twig or compound leaf stalk by silk and left to dangle in the breeze.

One *polyphemus* cocoon was found on a sassafras bush and one on willow, but the latter just under a small birch tree which yielded another. The author in the course of three or four hours collected ninety-nine *promethea* cocoons from sassafras bushes along a small stream valley that had its source in a cultivated field. Down where the stream flowed through a pasture not one cocoon was found, although there was an abundance of the food plants. Near towns cocoons of this moth are always rare here in Missouri, and the author has the first one yet to find in the city limits of Louisiana, although he has often searched for them on persimmon trees. Still, a number of years ago, he found them not uncommon on the shade persimmons inside the city limits of Fort Smith, Arkansas.

This year *cecropia* cocoons seem scarce and most of our finds have been on soft maple and willow, Lowell Pinkerton securing the greatest number.

While most of our large moths are more or less general feeders in the caterpillar stage, we expect to find them more abundant on special plants, *promethea* on sassafras, *cecropia* on plum, *polyphemus* on maple, *luna* on walnut, *imperialis* on maple and *regalis* on walnut, and yet all of these except *polyphemus* and *imperialis* may be found on persimmon. The author has even found the larva of *cecropia* feeding on fever wort, and once fed one through on walnut, securing therefrom the darkest moth he ever bred. The larva of *io* will feed on almost any leguminous plant, having been found on garden bean vines. It does well on *Amorpha*.

I am again under obligations to Miss Margaret Haley for the careful typing of this article.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, four weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.—Ed.

PHILADELPHIA, PA., APRIL, 1911.

THE PERIODICAL CICADA IN 1911.

Circular No. 132 of the Bureau of Entomology, U. S. Dept. of Agriculture, by Mr. C. L. Marlatt, Assistant Chief of the Bureau, dated February 13, 1911, calls attention to the Periodical Cicada of the present year. Two important broods of this insect, misnamed "locust," will appear. "One of these belongs to the 17-year race and extends from New York southward into North Carolina, in general lying east of the Allegheny Mountains." Technically it is known as Brood II and, although occurring in part of the same territory, must not be confused with the great brood—X— of the years 1902 and 1919. Brood II seems not to have appeared in any locality in sufficient abundance to receive a star (*) in Mr. Marlatt's records,† the device employed to indicate places (counties) where "the cicada occurred in one or more dense swarms." Observations made by Mr. H. H. Brehme, in Cape May County, New Jersey, in November, 1910, and published in the NEWS for March, 1911, page 142, hold out the possibility of such a dense swarm next summer.

The other brood due in 1911 is XXIII "of the southern, or 13-year race, and covers the lower half of the Mississippi Val-

†See especially Bulletin No. 71 of the Bureau, 1907.

ley....this is one of the largest of the 13-year broods, dividing this honor with Brood XIX" of 1907 and 1920.

On account of the overlapping of broods of the 17-year and 13-year races in different parts of the country, some uncertainty exists as to whether certain records of previous years are properly credited to the two broods due this year. Mr. Marlatt therefore calls especially for observers in North and South Carolina, in northern Missouri, southern Illinois and Indiana to note particularly the occurrence or non-occurrence of this insect this year. Records and specimens should be forwarded to the Bureau at Washington or to competent local entomologists and then published.

As to the protection of nurseries and young orchards from the cicadas, the most reliable means "is by collecting the insects in bags or umbrellas from the trees in early morning or late evening, when they are somewhat torpid. Such collections should be undertaken at the first appearance of the cicada and repeated each day." It would seem possible to use poultry to a large extent to destroy the insects on their emergence from the soil.

Note.—"1908" in line 13, page 4, of this Circular is an evident error for "1898."

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

Messrs. R. E. Snodgrass (whose excellent monograph on the Anatomy of the Honey Bee appeared in Technical Series No. 18, of the Bureau of Entomology, U. S. Dept. of Agriculture, of last May) and B. N. Gates have resigned their positions with the Bureau.

LISTRONOTUS BAGOIFORMIS Champ. in Utah.—Amongst some Curculionide sent me some ago by Mr. H. F. Wickham I have found a specimen of this species from Provo, Utah. It was described and figured by me in the "Biologia" (Col. iv, 4, p. 120, pl. 8, fig. 1), in December, 1902, and has perhaps not yet been recorded from north of the Mexican frontier. The types were found near the City of Mexico. The insect is closely related to *L. latiusculus*, Boh.—G. C. CHAMPION, Horsell, Woking, England. January, 1911.

THE WORK announced for the Lake Laboratory of the Ohio State University for the coming Summer includes a course in Entomology and the opportunity to carry on research work in problems upon insect life. The entomological work will be in charge of Professor Osborn, Invertebrate Zoology under Professor Brookover and Ecology under Professor Jennings, all including matter which is of distinct interest to entomologists. The session opens June 19, and additional information as to particular courses or the general announcement may be obtained upon application to the Director.—HERBERT OSBORN, Ohio State University, Columbus, Ohio.

A THREE-VOLUME Festschrift to Professor Richard Hertwig, of the University of Munich, in commemoration of his sixtieth birthday (Sept. 23, 1910) has appeared (Fischer, Jena). Of entomological interest among its contents are: Minchin, E. A. On some parasites observed in the rat flea (*Ceratophyllus fasciatus*). Schtschelkanowzew, J. P. Der Bau der männlichen Geschlechtsorgane von *Chelifer* und *Chernes*. Zur Kenntniss der Chelonethi im System. Sasaki, C. Life History of *Schlechtendalia chinensis* Jacob Bell (a gall-producing insect). Schwangart Ueber die Traubenwickler (*Conchylis ambiguella* Hübn, und *Polychrosis botrana* Schiff) und ihre Bekämpfung, mit Berücksichtigung natürlicher Bekämpfungsfaktoren.

UNDER THE WILL of the late Baron Edmond de Selys Longchamps, his sons have been publishing a *Catalogue Systematique et Descriptif des Collections Zoologiques du Baron Edm. de Selys Longchamps* in quarto form with colored plates and half-tone text figures. The following entomological parts have appeared: Fascicules VI. Trichoptera, pts. 1 and 2, G. Ulmer (Hamburg); XVII Cordulines and XVIII-XX Aeschnines, R. Martin (Paris); V, 1st part, Megaloptera and VIII Ascalaphidae, H. W. van der Weele (The Hague); IX-XI Libellulines, F. Ris (Rheinau). In manuscript ready for printing are Fascicules II Orthoptera, M. Burr (Eastry, Kent); III Psocidae, G. Enderlein (Stettin), and Termitidae, J. Desneux (Brussels); XII-XVI Libellulines, F. Ris; XXIV-XXV Calopterygines, R. Martin. In preparation are Fascicules IV Ephemeridae and Perlidae, F. Klapalek (Prague); V, pts. 2 and 3 Mecoptera, Planipennia and VII Myrmeleonidae, H. W. van der Weele; XXVI. pt. 1, Agrionines, F. Förster (Bretten, Baden). Each group is treated monographically and its consideration is not limited, in most cases, to the material in the Selys collections.

The elder son of Baron Edmond de Selys, Baron M. F. Raphael de Selys Longchamps, died at the family chateau of Longchamps at Waremmé, Belgium, January 11, 1911, in his seventieth year.

VOLUME 22 of the Journal of Morphology (Wistar Institute of Anatomy and Biology, Philadelphia), originally intended as a testimonial by former students and colleagues to the founder of the Journal, Professor Charles Otis Whitman, will, in consequence of his untimely death, become a Memorial Volume to him. The following entomological papers are announced as to be among its contents: Moenkhaus, W. J. The influence of inbreeding and selection on the fertility and sex ratio in *Drosophila*. Montgomery, T. H. The spermatogenesis of the Hemipteron *Euschistus*. Morgan, T. H. Further studies of oögenesis and spermatogenesis in Phylloxerans and Aphids. Wheeler, W. M. The ant colony as an organism. Wilson, E. B. A review of the chromosomes of *Nezara* with some more general considerations.

PROFESSOR J. M. ALDRICH, Moscow, Idaho, has received a grant from the Elizabeth Thompson Fund "to investigate the fauna of the waters and shores of western salt and alkaline lakes," and will spend a portion of next summer in a field trip, commencing his studies at Great Salt Lake and extending them westward at least as far as Mono Lake, Cal. The investigation will include all orders of insects as far as they exhibit adaptation to a salt or alkaline environment; the problems of greatest interest, perhaps, are those pertaining to several partially-known species of Ephydra, the larvae of which breed in salt and alkaline lakes. Professor Aldrich plans to visit all the lakes from which material of this kind has been reported, four or five in number, and any other lakes of like character along his route. He will be glad to receive suggestions from any entomologists who have made observations on the subject in view, or who may wish to have attention given to any collateral entomological problem in the interesting field to be visited.

CATOCALA BEUTENMÜLLERI AND C. WERNERI.—At the meeting of the Newark Entomological Society of Oct. 9th, 1910, as recorded in the Ent. News, March, 1911, p. 140, Mr. Beutenmüller is credited with the statement that *Catocala beutenmülleri* B. & McD. is the male of *C. wagneri* Poling. I presume the species Mr. Beutenmüller had in mind was *C. weneri* Bied. (Ent. News XX, 76, '09). At the time of description both ♂ and ♀ of *C. beutenmülleri* were before the writer and also the unique type of *C. weneri*, which is contained in Coll. Barnes. While both belong to the *verilliana* group, the two species are totally unlike in the appearance of the primaries; *C. weneri* is largely suffused with dark brown blotches, whereas *C. beutenmülleri* in both sexes is a clear bluish gray, without traces of brown patches. Their distinctness is without question.—J. McDUNNOUGH, Decatur, Illinois.

THE STUDY OF DISEASE-TRANSMITTING INSECTS.—With a view to furthering the work of the African Entomological Research Committee, Mr. Andrew Carnegie has been good enough to place at its disposal a sum of £1,000 a year for three years to defray the cost of sending a few suitably qualified young men to the United States to study the practical applications of entomology which have received so much attention in that country. Three of these Carnegie Scholars, as they are to be called, have been selected, and two of them are already at work in the States. The fact that Dr. L. O. Howard, Chief of the Bureau of Entomology at Washington, is personally interesting himself in the matter is a sufficient guarantee that all possible facilities will be given to the scholars, and it may be confidently expected that the scheme will be of great value to British administration in Africa and elsewhere by providing a body of well-trained entomologists available for employment in the services of the different Colonial Governments.

It may be mentioned that the Research Committee was appointed in June, 1909, by Lord Crewe, the then Secretary of State for the Colonies, with the object of promoting the study of the insects which play so prominent a part in the spread of disease among men, animals, and plants in Africa; that Lord Cromer is its President; and that it includes some of the most eminent authorities on entomology and tropical medicine in this country.

During the short period of the Committee's existence satisfactory progress has been made. The scheme has been energetically taken up by the African Colonies and Protectorates, and the large quantity of material already received at the Committee's Office in the Natural History Museum at South Kensington has very materially increased our knowledge of the insect pests of Africa. The collections of insects, after being properly identified and recorded, are being distributed to the Schools of Tropical Medicine, Universities, Museums, or other institutions where they are likely to be of value for the purpose of teaching or scientific study. Two skilled entomologists are being employed under the direction of the Committee in East and West Africa respectively, for the purpose of interesting and instructing the local officials in the work, and also of carrying out special investigations.

The Committee has issued quarterly a scientific journal, entitled the "Bulletin of Entomological Research," of which the first volume is just completed. It contains many important articles by well-known authorities, and is obtaining a wide circulation. Further particulars may be obtained from the Secretary of the Committee—Mr. Guy Marshall, British Museum (Natural History); South Kensington, London. Colonial Office,

23rd February, 1911.

A NEW WORK ON GALLS.—The E. Schweizerbartsche Verlagsbuchhandlung (Nägele & Dr. Sproesser), of Stuttgart, announce the undertaking of a pretentious work on galls: Die Zoocecidien, durch Tiere erzeugte Pflanzengallen Deutschlands und ihre Bewohner, by Ew. H. Rübsaamen, with the collaboration of Messrs. Thomas, Nalepa, Küster, von Schlechtendal, Dittrich, Börner, Grünberg, Mees, Schmiedeknecht, Kolbe, Ritzema-Bos and others. The chief value of the work is to lie in 150 plates of large quarto size, for the most part in 13-15 colors, by Werner & Winter, of Frankfurt-on-the-Main, from Rübsaamen's drawings. The text will amount to about 150 sheets (Bogen), and will include text-figures. The undertaking has the financial support of the German Imperial Ministry of the Interior. The first part is announced and the whole is to be finished in 1917.

CORRECTIONS IN DIPTERA of the New Jersey List of Insects, 1909.—I have noted the following minor corrections in the list of the order Diptera contained in Report on the Insects of New Jersey, 1909, by Dr. Jno. B. Smith.

Page 740, third line from bottom of page, read *Therioptecies* for "*Theriopectus*."

Page 745, genus *Spogostylum*, fourth species, read *limatulus* for "*limatula*."

Page 752, genus *Laphria*, third species, read *aeatus* for "*areatus*."

Page 753, figure 312, "*Asilus missouriensis*." This name is a synonym of *Proctacanthus milberti* and the figure, which is an old one, does not delineate either the habitus or generic characters of the genus *Asilus* as at present defined. Dr. Smith expresses the wish that the illustration may be eliminated from the literature, to which we say, Amen!

Page 755, third genus read *Campsicnemus* for "*Campicnemus*."

Page 755, seventh genus, read *Nematoproctus* for "*Nematoprotus*."

Page 812, genus *Agromyza*, sixth species, "*dimidiatus*" Walk. I can find no record of any such American species of either *Agromyza* or the old genus *Phytonomus* in Walker's lists or any of the other dipterological catalogs of more recent date. This species is evidently *diminuta* Walker which is known to mine the leaves of cabbage.

In Bulletin No. 10, new series, Division of Entomology, U. S. Dept. of Agriculture, Mr. D. W. Coquillett records the larvae of this species mining the leaves of potato in Missouri, leaves of white clover in Washington, D. C., and leaves of cabbage in California. It was also bred from a stem of cabbage at Ames, Iowa, by Mr. H. Osborn. In Aldrich's "List of Diptera" *Agromyza diminuta* is recorded as a synonym of *A. trifolii* Burgess on the authority of Mr. Coquillett who now recognizes it as a valid species.—W. R. WALTON, Bureau of Entomology, U. S. Dept. of Agriculture, Washington, D. C.*

* Published by permission of the Chief of the Bureau.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), excluding Arachnida and Myriapoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in Heavy-Faced Type refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted. This (*) following a record, denotes that the paper in question contains description of a new North American form.

For record of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

4—The Canadian Entomologist. 7—U. S. Department of Agriculture, Bureau of Entomology. 8—The Entomologist's Monthly Magazine, London. 11—Annals and Magazine of Natural History, London. 22—Zoologischer Anzeiger, Leipzig. 35—Annales, Societe Entomologique de Belgique. 38—Wiener Entomologische Zeitung. 40—Societas Entomologica, Zurich. 45—Deutsche Entomologische Zeitschrift. 90—Revue Scientifique, Paris. 92—Zeitschrift fur wissenschaftliche Insektenbiologie. 99—Cornell University Agricultural Experiment Station, Ithaca. 104—Mittheilungen, Naturhistorisches Museum in Hamburg. 159—Bollettino, Laboratoria di zoologia generale e agraria della R. S. Superiore d' Agricoltura in Portici. 179—Journal of Economic Entomology. 189—Pomona Journal of Entomology, Claremont, Cal. 191—Natur, Munchen. 194—Genera Insectorum, Dirigés par P. Wytsman, Bruxelles. 216—Entomologische Zeitschrift, Stuttgart. 251—Annales, Sciences Naturelles, Zoologie, Paris. 305—Deutsche Entomologische National-Bibliothek, Berlin. 314—Atti del R. Istituto d'Incoraggiamento di Napoli. 315—Memoires, Academie Royale de Belgique, Classe des Sciences, 2d ser., Brussels. 316—Canada Department of Mines, Geological Survey Branch, Ottawa.

GENERAL SUBJECT. Fernald, Osborn, Bruner, etc.—Present methods of teaching entomology, 179, iv, 63-90. Handlirsch, A.—Canadian fossil insects, 5. Insects from the Tertiary lake deposits of the southern interior of Br. Columbia collected by Lawrence M. Lambe in 1906, 316, Mem. 12-P, 93-129 (*). Meissner, O.—Kurze Bemerkungen ueber einige neuere naturwissenschaftliche Theorien, 40, xxv, 87-88. Pierantoni, U.—Sulla utilizzazione dei ragni quali predatori d'insetti nocivi in agricoltura, 314, lxi, 317-321. Plateau, F.—Recherches experimentales sur les fleurs entomophiles peu visitees par les insectes, rendus attractives au moyen de liquides sucs odorants, 315, ii, fasc. 7, 55 pp.

APTERA AND NEUROPTERA. A. L.—L'Industrie des Termites, 90, xlix, 150-151. Crawford, D. L.—American Psyllidae III (Triozinae), 189, iii, 422-453 (*). Holmgren, N.—Versuch einer Monographie der amerikanischen Eutermes-Arten, 104, xxvii, 171-325 (*). Ulmer, G.—Einige sudamerikanische Trichopteren, 35, iv, 15-26.

ORTHOPTERA. Shelford, R.—Fam. Blattidae, Subfam. Blattinae (= Periplanetinae), 194, 109 fasc., 27 pp.

HEMIPTERA. Bergoth, E.—On some controversial items concerning a few Hemiptera, 35, iv, 28-29. Butler, E. A.—A contribution towards the life-history of *Miris laevigatus*, 8, xxii, 36-40. Crosby, C. R.—The apple red bugs (*Heterocordylus malinus* and *Lygidea mendax*), 99, Bull. No. 291, 213-225. Davidson, W. M.—Notes on some Aphididae taken in Placer County, Cal., 189, iii, 398-399. Enslin, E.—*Gargara genistae* und *Formica cinerea*, 92, vii, 19-21. Essig, E. O.—Aphididae of So. California V, 189, iii, 400-403. Notes on Coccidae VI, 189, iii, 404-411. Marlatt, C. L.—The periodical cicada in 1911, 7, Circ. No. 132, 5 pp. Wilson, H. F.—Two new genera and seven n. sp. of the family Aphididae, 4, xliii, 59-65 (*).

LEPIDOPTERA. Bird, H.—New histories and species in *Papaipema* and *Hydroecia*, 4, xliii, 37-47 (*). Comstock, W. P.—*Thecla chrysalus*, and its variety *citima*, 4, xliii, 65-66. Coolidge, K. R.—*Melitaea theona* Menetries and its synonymy, 4, xliii, 50-52. Fischer, E.—Ei, Raupe und Puppe von *Argynnis pandora*, 40, xxv, 79-80. Gerwein, E.—Kopula von *Taeniocampa stabilis* male and gothica female, 92, vii, 27. Ihering, H. V.—Ueber sudbrasilianische Schädlinge der Feige, 305, ii, 20-21. Leigh, H. S.—A biological inquiry into the nature of Melanism in *Amphidasys betularia*, 216, xxiv, 240. Linstow, V.—Der morphologische Geschlechtsdimorphismus der Schmetterlingsflügel und seine Bedeutung, 45, 1910, 45-53. Meyrick, E.—Heterocera (Pyrales) Fam. Orneodidae, 194, 108 fasc., 4 pp. Schaus, W.—New species of Heterocera from Costa Rica, V, 11, vii, 173-193 (*). Stichel, H.—Rhopalocera, Fam. Riodinidae. Allgemeines-Subfam. Riodininae, Teil 1, 194, 112a fasc., 238 pp. Unzicker, Dr.—*Citheronia regalis* und ihre Zucht, Ein Beitrag nach Studien in ihrer Heimat, 92, vii, 21-23.

DIPTERA. Bezzi, M.—Un nuovo genere di Asilidi 159, iv, 174-179 (*). Coquillett, W. B.—A decision on Meigen's 1800 paper, 4, xliii, 66. Kieffer, J. J.—Description de quelques Dipteres exotiques. (Sciara), 159, iv, 327-328 (*). Martelli, G.—Alcune note intorno ai costumi ed ai danni della Mosca delle Arance (*Ceratitis capitata*), 159, iv, 120-127. Notizie sulla *Drosophila ampelophila*, 159, iv, 162-174. Rothschild, N. C.—Liste des Siphonaptera du Museum

d'Histoire Naturelle de Paris, accompagnée des descriptions des espèces nouvelles, 251, xii, 203-216. Sanders, G. E.—Notes on the breeding of *Tropidorpria conica*, 4, xliii, 48-50. Summers, S. L. M.—Entomological notes from the London School of tropical medicine.—No. 1, Description of a n. sp. of Tabanidae from Br. Guiana, 11, vii, 213-215.

COLEOPTERA. Anon.—Das Gehirn eines Kafers, 191, 1911, 143. Blunck, H.—Zur kenntnis der Natur und Herkunft des "milchigen secrets" am Prothorax des *Dytiscus marginalis*, 22, xxxvii, 112-113. Bowditch, F. C.—Notes on *Diabrotica* and descriptions of n. sp. (cont.), 4, xliii, 53-58. Essig, E. O.—The natural enemies of the citrus mealy bug, III, 189, iii, 390-397. Hagedorn, M.—Fam. Irididae, 194, 111 fasc., 178 pp. Kissel, F.—Bie Kissel'sche Russelkafer Falle, 92, vii, 23-25. Raffray, A.—Coleopterorum catalogus. Pars 27: Pselaphidae, 222 pp. Schmidt, A.—Lamellicornia, Fam. Aphodiidae, 194, 110 fasc., 155 pp. Schubert, K.—Neue exotische Staphyliniden, 45, 1910, 1-39. Silvestri, F.—Metamorfosi del *Cybocephalus rufifrons*, e notizie sui suoi costumi, 159, iv, 220-227. Contribuzioni alla conoscenza degli insetti dannosi e dei loro simbiotici 1. *Galerucella dell' olmo* (*Galerucella luteola*), 159, iv, 246-289.

HYMENOPTERA. Howard, L. O.—A note on the Indian enemies of *Aleyrodes citri*, with description of a n. sp. of *Prospaltella*, 179, iv, 130-132 (*). Kieffer, J. J.—Description de nouveaux Hyménoptères, 159, iv, 105-117 (*). Nouveaux Cynipides exotiques, 159, iv, 329-342 (*). Fam. Scelionidae. Addenda et corrigenda, 194, 80b fasc., 61-112. Schmeideknecht, O.—Opuscula Ichneumonologica Fasc., xxvii, p. 2081-2160. Strand, E.—Zwei neue sudamerikanische *Stenophasmus* (Stephanidae), 38, xxx, 14-15. Trani, E.—Di un nuovo Proctotrupidae parassita delle larve degli *Anthrenus musaeorum*, 314, lxi, 19-24. Viehmeyer, H.—Hochzeitsflug und Hybridation bei den Ameisen, 305, ii, 28-30.

A SYNOPSIS OF THE ORTHOPTERA OF WESTERN EUROPE.—By Malcolm Burr. London, 1910. 160 pages. Oliver Janson, 44 Great Russell Street, W. C. Price 3s. 6d.

This most useful handbook first appeared in parts in the *Entomologist's Record and Journal of Variation*, forty-three installments having been published between 1903 and 1909. In the present little volume the matter is presented as first published with several pages of addenda dealing with corrections of classification and nomenclature and certain additional more recently described species.

The treatment is concise, yet full enough to serve the purpose of the work, which the author says "does not claim to be more than a pocket-handbook for the use of collectors in the field."

The geographic scope of the work covers the region "west of Vienna," to pass beyond which "would mean the inclusion of Eastern Europe, with Russia, and the Balkans." It might be well to emphasize even more strongly than the author does the fact that the present work is the first of anything of a similar character published in the English language, our great works of reference on European Orthoptera being in German, French and Spanish.

The generic tables seem to be very carefully constructed, while the specific tables present in most cases a wealth of differential characters instead of the meagre alternatives so frequently found. Under the species are given very graphic descriptions with beclouding technicalities reduced to a minimum, while such as are used are explained under the family headings.

The geographic information is of the sort which makes one who is more than a taxonomist happy, as the author has the ability to give in a few terse sentences a clear yet fairly detailed statement of the range of a species, generally prefacing the limitations of the range with the general region or regions inhabited.

The number of species of Forficulidæ treated is twenty-four, of Blattodea twenty-two, of Mantidea thirteen, of Phasmidea four, of Acridiidea one hundred and thirty-five, of Locustodea one hundred and sixty-one, of Gryllodea thirty-five. On tabulating the species according to the sections of Western Europe to which they are restricted one is first struck with the great number of Iberian (Spain and Portugal) forms, thirty-three Acridiidea, sixty-three Locustodea and fourteen Gryllodea being found nowhere else in the territory covered, a few of them being found in northern Africa as well, although the vast majority are indigenous to the peninsula. The next numerical element in a tabulation of the species is a Mediterranean one, including species found in Spain and Portugal as well as the south coast region of France, Italy and the portion of the Adriatic country covered by the work. The Acridiidea of this element number twenty-eight, the Locustodea forty-eight and the Gryllodea ten. The boreal element is numerically far less than either the Iberian or Mediterranean elements.

In the reviewer's opinion the splitting up of the old blanket genus *Stenobothrus* (pp. 27-28, 32-47) is greatly to be commended, although the author may not be universally followed in according the divisions generic rank. Although Bolívar had previously applied these divisions in a subgeneric sense to the Iberian species, the present work is the first to assign the more numerous extra-Iberian forms.

A curious lapse occurs near the bottom of page 16 where *Blatta germanica* is used instead of *Blatta orientalis*, *germanica* being properly used on the middle of the same page. The latter species, our familiar

Croton-bug, we are told is called "Prussian" in Russia and "Russian" in Prussia.

To our brother Orthopterists we would commend this Synopsis as a model of what such a condensed manual should be, and we earnestly hope the day may soon come when our own country will have such handbooks of not only the Orthoptera but other orders as well. To our English friend, who has put so much time and love into the compiling of this work, we give our grateful thanks for what we know will be well thumbed by others as well as ourselves.—J. A. G. R.

Doings of Societies.

ENTOMOLOGICAL SOCIETY OF AMERICA.

The fifth annual meeting was held at the University of Minnesota, Minneapolis, December 27th and 28th, 1910, in the School of Mines building. The president, Dr. J. B. Smith, presided throughout the session. In the absence of the Secretary-Treasurer, Professor J. G. Sanders was elected Secretary pro tem.

The following papers were read during the session:

E. L. Dickerson.—"Notes on the Tingid *Leptobyrsa explanata* Heid."

J. B. Smith.—"Notes on *Sanninoidea exitiosa*."

J. P. Jensen.—"The structure of spermatophores in crickets."

S. J. Hunter.—"The biological survey of the insect life of Kansas."

H. C. and H. H. Severin.—"An experimental study of the death-feigning habits of *Belostoma* (*Zaitha*) *flumineum* and *Nepa apiculata* Uhler."

C. H. T. Townsend.—"Announcement of further results secured in the study of Tachinidae and allies."

T. D. A. Cockerell.—"Some suggested rules to govern entomological publications."

The report of the Committee on Nomenclature was received and ordered printed.

The report of the Executive Committee showed that nineteen new members had been received during the year and four lost through death.

The result of the mail vote ordered by the Society at the Boston meeting was, that the annual dues of the Society should be two dollars, this to include a subscription to the *Annals of the Entomological Society of America*.

The following officers were elected: President, Professor Herbert Osborn; First Vice-President, Professor Lawrence Bruner; Second Vice-President, Professor Alex. D. MacGillivray; Secretary-Treasurer, Professor Alex. D. MacGillivray.

Additional members of the Executive Committee: Professor J. H. Comstock, Professor J. B. Smith, Professor C. J. S. Bethune, Dr. W. M. Wheeler, Dr. H. Skinner, Dr. A. D. Hopkins.

The Annual Public Address was given in Handicraft Hall by Professor F. L. Washburn: "The Typhoid Fly in the Minnesota Iron Range." ALEX. D. MACGILLIVRAY, *Secretary-Treasurer*.

FELDMAN COLLECTING SOCIAL.

Meeting of Dec. 21st, 1910, held at 1523 S. 13th St., Philadelphia. Twelve members present; Mr. Lewis H. Traunweiser, visitor. President Harbeck in the chair.

Prof. Smith commented on the different departments of the colleges he visited in Europe and said he was surprised at the amount of entomology taught in connection with the medical courses, which of course is mostly on insects which are carriers of disease. He gave details of his trip, which was for the purpose of looking up the water plant *Azolla* to be used in exterminating mosquitoes, and which was described in the *News* for December.

A copy of the new New Jersey list of insects was shown.

Mr. C. T. Greene exhibited and recorded the following Diptera, all collected by himself: *Masicera albifrons* Town., Castle Rock, Pa., VIII-29-'09; *Chaetona nitens* Coq., Wenonah, N. J., IX-5-'10; *Tachytrechus moechus* Loew, Bromall, Pa., VII-1-'10; and *Gymnopternus chalcocrurus* Loew, Wenonah, N. J., V-15-'10.

Dr. Castle said that on his trips to Florida he had taken

twelve species of *Chlaenius* and had succeeded in adding two to this on his latest trip, *C. maxillosus* Horn and *herbaceus* Chev. Of the former he believed that only two specimens were known and that it was not represented in the Horn Collection, while the latter was represented by one specimen.

Mr. Haimbach invited the Social to hold its next meeting at his home, 150 Sumac Street, Wissahickon. Adjourned to the Annex.

Meeting of January 18, 1911, at the home of Frank Haimbach, 150 Sumac Street, Wissahickon, Philadelphia. Thirteen members present. Prof. F. M. Webster, of Washington, D. C., visitor. President Harbeck in the chair.

The President read his annual address which was ordered to be incorporated in the minutes.

The following officers were nominated and elected to serve for the year 1911: President, F. Haimbach; Vice-President, H. A. Wenzel; Treasurer, H. W. Wenzel; Secretary, George M. Greene; Assistant Secretary, C. T. Greene.

Prof. Smith said that two or three months ago, just before the bad weather, he had received word that something was turning up the ground in Cape May County. He sent Mr. Brehme down to Sea Isle Junction, and found that it was as he had supposed, the Periodical Cicada, but these insects instead of making chimneys, had made mounds like ant hills, the openings of which did not come through to the top but just caused upheavals of the ground. The burrow was followed for six feet but did not reach the bottom and therefore no larvae were secured. In one place Italians were making a cut of eight feet but still the bottom of the burrows had not been reached. He stated that later some larvae had been sent to him from a locality where there was shale and they could only go to the depth of a few inches.

Mr. Wenzel described the manner in which he had dug for *Bledius*.

Prof. Webster mentioned the collectors and collections in a

general and humorous manner and then gave an interesting talk on imported species of several orders, particularly as to their wide distribution. One species, a fly, was bred by Mr. Johnson, from the University grounds here and later turned up in Arizona. He stated that many varieties of insects were imported to this country by the Spaniards, years ago, and also that the distribution of the different species was largely aided by the Jesuit priests in their travels through different countries when they carried with them grains and fruits gathered at points where they stopped.

Mr. Wenzel exhibited a live, wingless female grasshopper, *Aptenopedes sphenarioides* Scudder, collected by Mr. Schmitz in the street at noon of the date of the meeting, the temperature at that time being about 25 deg. Fahrenheit.

After an elaborate musical program furnished by Mr. Haimbach's family and friends, the members were invited to the dining room, where they were again well entertained.

GEO. M. GREENE, *Secretary*.

AMERICAN ASSOCIATION OF ECONOMIC ENTOMOLOGISTS.

The twenty-third annual meeting of the American Association of Economic Entomologists was held at Minneapolis, December 28 and 29, 1910. The full proceedings are published in the *Journal of Economic Entomology* (the official organ of the Association) for February, 1911. Some of the more interesting features of the proceedings were: The consideration of a committee report on a proposed affiliation of the Association with ten other non-entomological societies under the name of the Affiliated Societies of Agricultural Science, a general meeting to be held biennially; each affiliated society to retain its own organization and to hold such other meetings as it may elect and to issue its own Proceedings, but the Proceedings of all to conform to a uniform style of page, paper and type. The report of the committee was received and the com-

mittee continued. The President's address by E. Dwight Sanderson, was "The Work of the American Association of Economic Entomologists." Prof. T. S. Headlee presented a brief report on the work now being prosecuted by some economic entomologists in the State universities, agricultural colleges and experiment stations of the United States, listing the names of 101 projects, and the investigator undertaking each one, with his address.

The adoption of a preamble and resolution that, "*Whereas*, there now exists a great lack of properly trained men for the work in economic entomology in the country at large, be it *Resolved*, by the Association that universities and agricultural colleges within whose province it naturally falls to supply this need, be urged to provide adequate facilities for the thorough training of capable men for the profession of economic entomology."

A symposium on the present methods of teaching entomology, is represented by four papers by Profs. J. H. Comstock, H. T. Fernald, Herbert Osborn and Lawrence Bruner respectively, followed by an extended discussion.

The same number of the *Journal of Economic Entomology* contains the Proceedings of the ninth annual meeting of the American Association of Official Horticultural Inspectors, including an extended paper by C. L. Marlatt on the need of a national control of imported nursery stock, and shorter ones by Dr. L. O. Howard, G. G. Atwood and F. Windle.

OBITUARY

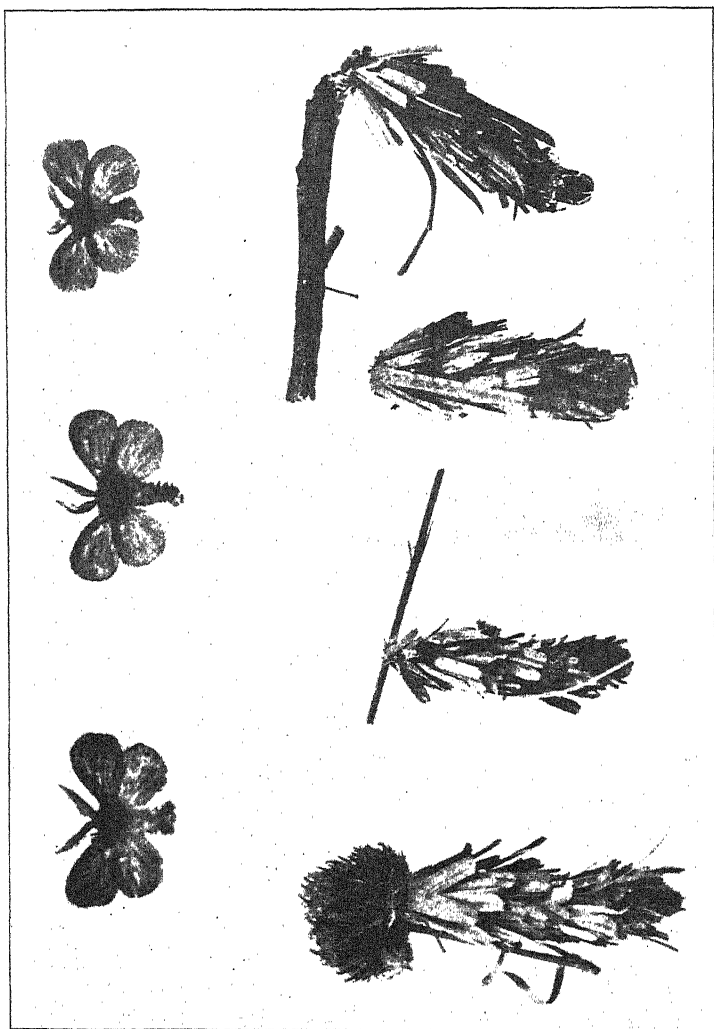
JAMES WILLIAM TUTT, English Lepidopterist, and Editor of the *Entomologists' Record and Journal of Variation* (London), from 1890 to 1910, died January 10, 1911, at Rayleigh Villa, Westcombe Hill. From a sympathetic notice of his life by Dr. T. A. Chapman, in the *Entomologist* for February, 1911, we learn that he was born at Strood, Kent, April 26, 1858. Most of his mature years were spent as a schoolmaster

in London. He began contributing to the *Entomologist* in 1884, was an active member of the City of London (President 1896-1899) and South London (President 1899) Entomological and Natural History Societies, a Fellow of the Entomological Society of London since 1885, and President-nominate of this last at the time of his death. His chief papers and books are on *Melanism*; *The British Pterophorina*; *Migration of Insects*; *The British Noctuae and their varieties* (4 volumes); *Practical Hints for the Field Lepidopterist* (3 volumes); *British Butterflies*; *British Moths*; *Randoms in Alpine Valleys*; *Woodside, Burnside, Hillside and Marsh*; *Random Recollections* and, lastly and chiefly, *A Natural History of the British Lepidoptera*, of which six thick volumes have appeared, I-V, 1899-1906, treating of Moths, and VIII, 1905-'06, of Butterflies. These last, says Dr. Chapman, "are noteworthy not only for their encyclopedic character in relation to each species handled, but also for the critical discussions on many points of classification and nomenclature. This, however, is not the place for further review, beyond noting the evidence afforded of Tutt's amazing industry, and the width and vigor of his mental grasp." Elsewhere Dr. Chapman remarks, "It was simply impossible for him to be idle; he must work away at full steam all the time."

"His extensive collections, occupying some dozen cabinets are less remarkable for the rarities they contain than for presenting many long series, and for being very largely of his own collecting. It is stated that they are to be disposed of during the next two years."

From our contemporaries also we learn of the deaths of the following entomologists:

E. A. LEVIELLE, at the age of 70 years; EDWYN CARLOS REED, Director of the Museo de Concepcion, Chile, on November 5, 1910; ELZEAR ABEILLE DE PERRIN, Coleopterist, at Marseilles, aged 68 years, and Prof. GIRON, Lepidopterist, of the Belgian Entomological Society.



EURYCTTARUS TRACYI—JONES.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXII.

MAY, 1911.

No. 5.

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A New North American Moth of the Family Psychidae (Lepid.).

BY FRANK MORTON JONES, Wilmington, Delaware.

(Plate VI.)

Eurycttarus tracyi nov. sp.

Male.—Antennæ larger and more broadly pectinated than in *confederata*, each pectination terminated with a bristly tuft; thorax heavy, densely hairy; abdomen hairy, in dried examples barely exceeding secondaries; wings broad; primaries short, costa full, apex so rounded that no angle is discernible; secondaries broad, evenly rounded; color smoky brownish gray, the primaries and thorax slightly darker than the secondaries and abdomen; wings without markings, not very opaque, in some lights with a brilliant purplish-blue reflection beneath, fainter above; expands 17-19 mm; vein 6 absent on both wings, which refers this insect (Neum. and Dyar, Jour. N. Y. Ent. Soc. 11, 118) to *Eurycttarus* Hamps.; the anal vein of primaries forks at half its length from base, the upper branch arching in a regular curve, not angled at its point of widest separation as in *confederata*; vein 8 of primaries not stemmed with 9 before reaching cell, or in some examples very shortly stemmed (in *confederata* the stem is as long as the remaining length of 8 from stem to margin of wing); on secondaries the oblique vein from 8 divides the vein at about half its length from base; in *confederata* this oblique vein is about one third distant from the base; other differences, due to the widely different wing-shape, will appear by comparison.

Larval Case: Length 21-27 mm., and of almost uniform diameter; thatched outside with short flat pieces of dried grass, closely applied, and overlapped or shingled longitudinally.

Described from four males bred (May, 1910) from larvae and numerous cases collected at Biloxi, Mississippi. Types are deposited in the U. S. National Museum and in my own collection.

The female is wingless and grub-like as in the related species; a single female was bred but was not secured in condition for detailed description. Like *confederata*, this insect passes the winter as a larva, apparently always in the last larval stage, and feeds for a short time in early spring, suspending its case to some tree, fence, or twig for final transformation. Though apparently by choice a grass-feeder in swampy places, the spring-time food is often the petals of flowers, and several larvae were found devouring the tender yellow petals of pitcher plants (*Sarracenia sledgei*). Though of less expanse, this is a much more robust insect than the well-known *E. confederata* G. & R. and its larval case is proportionately larger. I take pleasure in dedicating this interesting species to Prof. S. M. Tracy, whose hospitality and knowledge of the district and its flora added greatly to the pleasure and profit of my stay at Biloxi.

Cases of Phoresie.

BY NATHAN BANKS, East Falls Church, Va.

The cases where insects are transported by other insects are comparatively few. Among the mites, there are long series of forms in which it is the rule that the mite is in some of its stages transported by insects. The well-known case of the triungulins of Meloidae, being carried by bees, is found in all text-books. But there is a considerable number of records of other insects being transported by larger insects. Some years ago Mrs. Slosson sent me some Chrysopids from Mt. Washington that had, clinging to their wings, some small flies.

Since then I have been interested in listing articles on this subject, and the titles, with comment, are herewith presented, recognizing, of course, that the list is not complete.

Meigen, J. W.—Systematische Beschreibung der europäischen zweiflügeligen Insekten VII, p. 409, 1838.

Describes *Limosina sacra*, a Borborid fly found on the under surface of the sacred Scarabæus (*Ateuchus sacer*).

Xamheu, P.—Bull. Soc. Ent., France, 1877, p. lxix. Records finding a specimen of a Chalcidid.

Podagrion pachymerus Dalm., attached to the under wings of a *Mantis religiosa* L.; it waits till the female makes an egg-mass, and then deposits its eggs therein.

Moulton, J. T.—Flies riding on a tumble-bug. Amer. Entom., vol. III, p. 226, 1880.

Noticed in Missouri, a small fly (possibly *Limosina*, from the brief description), riding on a tumble bug.

Sharp, D.—Proc. Ent. Soc., London, 1890, p. xxx.

Exhibited a specimen of one of the bird flies, *Ornithomyia aricularia*, to which were attached by their mandibles several specimens of Mallophaga.

Eaton, A. E.—Flies riding on beetle back.—Ent. Mo. Mag., 1896, p. 139.

Borborid fly on back of a coprophagous beetle in England.

Walker, J. J.—Flies riding on beetle back.—Ent. Mo. Mag., 1896, p. 161.

Notes *Ateuchus variolosus* at Gibraltar with Borborid flies upon them.

Lesne, P.—Mœurs du *Limosina sacra*. Phénomènes de transport mutuel chez les animaux articulés; origine du parasitisme chez les insectes Diptères.—Bull. Soc. Ent., France, 1896, p. 162-165.

Gives account of *Limosina sacra* on specimens of *Ateuchus laticollis*; also notes that larvae of *Antherophagus* (Cryptophagid beetles), ride on bees like triungulins of Meloids. Lesne proposes the term "*phorésie*" for this transportation of one insect by another.

Chobaut, A.—Observations sur un Diptère vivant sur les Ateuchus.—
Bull. Soc. Ent., France, 1896, p. 166.

Confirms the observations of Lesne.

Bloesch, Ch.—Physapodes se sont transporter par les guepes.—Feuille
Jeun. Natur. (3) vol. XXV, p. 75-76, (1896).

Slosson, Mrs. A. T.—Singular habit of a Cecidomyiid—Ent. News, 1896.
p. 238.

A Cecidomyiid attached to *Chrysopa*; suggested that the cecidomyiid is predaceous on plant lice, that are also preyed upon by the *Chrysopa* larvae.

Cummings, H. A.—Parasites of the house-fly. Science Gossip, 1899.—
(Amer. Mo. Micr. Journ., Oct., 1899, p. 318.)

Notes that in Bermuda a small red ant is carried by the fly.

Kertész, K.—Dipterologisches aus New Guinea. Termes. Füzetek.
XX, p. 611-613, 1897.

Small flies riding on a large one.

Biro, L.—Commensalismus bei Fliegen.—Termes. Füzetek. XXII, p.
200, 1899. (Also Rovartani Lapok, 1897, p. 129).

Two *Agromyza minutissima* carried by an *Ommatius minor*,
in New Guinea.

Mik, J.—Merkwürdige Beziehung zwischen *Desmometopa m.- atrum*
Meig. aus Europa und *Agromyza minutissima* V. d. Wulp. aus
New Guinea.—Wien. Ent. Zeit., 1898, p. 146-151.

Found 13 specimens of a small fly (*Desmometopa (Agromyza) m-atrum*) attached to a dead worker bee, that was still fresh. Reviews papers by Biro and Kertész.

Warner, W. V.—Proc. Ent. Soc. Wash., V. p. 308-309, 1903.

Exhibited specimen of *Scelio (Scerphidae)* clinging by jaws to the side of a grasshopper, *Dichromorpha viridis*. The genus *Scelio* is parasitic on the eggs of grasshoppers.

Schulz, W. A.—Dipteren als Ektoparasiten an südamerikanischer Tagfaltern.—Zool. Anzeiger, XXVIII, p. 42-43, 1904.

Notes Phoridae attached to butterflies of genera *Morpho* and *Helicopsis* in Brazil.

Fletcher, T. B.—Ent. Mo. Mag., 1909, p. 168.

He exhibited at meeting of Ent. Soc. Lond. 2 June, 1909, an example of *Scarabaeus gangeticus* taken on wing, carrying small Borborid flies.

The habit of certain Borborid flies in attaching to coprophagous beetles is evidently world wide, and undoubtedly aids them in locating suitable breeding places. The habit of certain Hymenopterous egg-parasites of clinging to parents of the eggs is quite possibly confined to certain groups. The other cases are difficult of classification, and some may be accidental.

Three new species of Cynipidae (Hym.).

BY WILLIAM BEUTENMULLER, American Museum of Natural History, New York City.

Dryocosmus favus sp. nov.

Female.—Head black, finely rugoso-punctate, mouth parts dull rufous. Antennæ 14-jointed, first joint quite stout, second much shorter, third long, slender at base and broad at end, fourth about one-half as long as the third, fifth shorter than the fourth, sixth to last short and almost uniform in size, deep brown, terminal joints almost black. Thorax jet black, smooth and shining, very minutely punctate anteriorly and laterally, which parts are slightly hairy. Parapsidal grooves sharply defined, with a few short hairs along the outer edges. Median groove wanting. Anterior parallel lines very short and scarcely evident. Lateral grooves wanting. Pleurae very finely rugose, with a rather large polished area. Scutellum finely rugose, with a lateral ridge which extends around the apex, foveæ at base not distinct. Abdomen black, smooth and shining with a few short hairs at the base dorsally. Legs pitchy brown pubescent, coxæ black. Wings hyaline, veins pitchy brown. Radial area partly open. Areolet distinct. Cubitus extending to the first cross-vein. Length, 3 to 3.50 mm.

Gall.—In clusters from about fifty to one hundred on the trunks of young red and scarlet oaks (*Quercus rubra* and *coccinea*), immediately above the ground, in autumn. Hard and woody (when dry) probably soft when fresh, monothalamous. Oblong, narrower at base than at apex, which is flat. In form they are somewhat like square tubes or five or six-cornered tubes, giving them the appearance of cells of a honeycomb. Hollow inside and rather thin-walled. The fly emerges

from the apex of the gall. Length, 5 mm.; width of apex, 3 mm.; diameter of cluster, 28 mm.

Habitat: Phillips Bluff, La.; Fleetwood, Pa.

The fly was described from many specimens loaned to me by Prof. A. D. Hopkins. The species belongs to the European genus *Dryocosmus* Giraud not heretofore recorded from North America. The fly emerges very early in spring and the gall reaches maturity late in fall.

***Amphibolips nigra* sp. nov.**

Female.—Head rugose more so on the cheeks and vertex. Ocelli large and smooth. Antennæ rather short and stout, 16-jointed. Thorax black, coarsely rugose with the parapsidal grooves lost in the rough surface. Anterior parallel lines and lateral grooves present, pubescent. Pleuræ rugose but less so than the thorax on top. Scutellum black, coarsely rugose with two large somewhat shining foveæ at the base separated by a fine ridge. Abdomen black, slightly shining, minutely punctate and covered with very short, whitish hairs. Legs black, punctate and hairy, tarsi brown. Wings dusky hyaline with a darker streak beyond the radial area, veins brown and thick, second cross-vein in a brown cloud. Areolet large, cubitus extending to the first cross-vein. Radial area open. Length, 5 mm.

Habitat: Durango, Mexico. February 1-7, 1897 (Dr. Edward Palmer).

Type: United States National Museum.

***Andricus durangensis* sp. nov.**

Female.—Head very deep reddish brown, cheek and vertex granulated, face more coarsely sculptured. Antennæ 14-jointed, slender. Thorax coarsely granulated, very deep reddish brown, almost black. Parapsidal grooves, anterior parallel lines, median and lateral grooves present distinct, but not sharply defined owing to the rough surface of the thorax. In one example the median and parapsidal grooves are scarcely evident. Pleura rugose. Scutellum coarsely rugose with the foveæ at base not distinct. Abdomen smooth, shining red. Legs dark reddish brown. Wings glassy hyaline, veins brown, first radial vein not reaching the costa. Areolet present. Cubitus not touching the first cross-vein. Second transverse vein curved. Length, 4 mm.

Habitat: Durango, Mexico. April 3—May 6. (Dr. Edward Palmer.)

Type: United States National Museum.

The American species of *Diatraea* Guilding (Lepid., Pyralidae).

BY HARRISON G. DYAR, U. S. Nat. Mus., Washington, D. C.

I have referred (Proc. ent. soc. Wash., xi, 29, 1909) to the fact that Sir G. F. Hampson, in his revision of the Crambinae (Proc. Zool. soc. Lond., 1895) describes the genus *Diatraea* in his synoptic table as having a frontal prominence, whereas the type species, *saccharalis* Fabr., is really without this structure. It is true that in the text the frontal prominence is not mentioned, the statement being "frons with a tuft of hairs." I was formerly inclined to regard this as an error in the diagnosis, subject to correction, but the examination of further material has convinced me that the frontal prominence is a variable character, of less than specific value. The generic table will need correction, but the genus *Diatraea* may include species with or without the frontal prominence.

In the same paper Hampson recognized but three American species of *Diatraea*. This number will have to be considerably amplified. I arrange the species at present in the following manner:

§ 1. *Saccharalis* group.

Diatraea saccharalis Fabricius.

This species is divisible into a number of well-marked geographical forms. Two of them occur in the United States. The typical *saccharalis* reaches us by the way of the West Indies and occurs in Florida. The race *crambidoides* Grote comes from Mexico and occurs in the Gulf States. The following subspecies are before me:

Diatraea saccharalis saccharalis Fabricius.

Phalaena saccharalis Fabricius, Ent. Syst., III, 2, 238, 1794.

Crambus leucaniellus Walker, Cat. Brit. Mus., XXVII, 161, 1863.

This form is small, the wings rather narrow, but squarely tipped and not especially pointed. The front is smooth and flat, scarcely at all projecting before the eyes and without any trace of the frontal cone or tubercle. Specimens are before me from French Guiana (W. Schaus), Cuba (W. Schaus,

E. A. Schwarz), Trinidad (F. W. Urich) and a single female from Peru. Also a female from southern Florida (H. G. Dyar). Walker's *Crambus leucaniellus* was described from Santo Domingo and so must belong to this form; but I have not seen any males from Santo Domingo. The two females before me (A. Busck) agree with Cuban females.

Diatraea saccharalis grenadensis, new variety.

A single male is before me. The front is distinctly protuberant, but smooth, without any cone; the hind wings are white, the fore wings pale straw color and pointed at apex. The specimen looks like a little female.

Grenada, British West Indies (Schaus collection).

Type, No. 13610 U. S. National Museum.

Diatraea saccharalis oblitteratellus Zeller.

In this the front is strongly roundedly protuberant and there is a minute cone towards the upper part of the front. It was described from Brazil. I have females only from Castro, Parana, Rio Janeiro and Nova Friburgo (Schaus collection), besides one from Sapucay, Paraguay (W. T. Foster).

Diatraea saccharalis tabernella, new variety.

The front is rather flat, but is drawn out above into a distinct pointed cone, somewhat flattened dorso-ventrally. The hind wings are white in the male as well as in the female. The fore wings are straw-color, the two lines of dots present in both sexes, but rather weak in the females or partly obsolete. The wings are rather narrow, squarely shaped, the apex pointed.

Canal Zone, Panama and Nicaragua.

Types, male and female, Tabernilla, Canal Zone, Panama (A. Busck).

Type, No. 13611, U. S. National Museum.

This form may possibly be a distinct species.

Diatraea saccharalis crambidoides Grote.

Chilo crambidoides Grote, Can Ent., XII, 15, 1880.

? *Crambus lineosellus* Walker, Cat. Brit. Mus., XXVII, 162, 1863.

In this form the front is roundedly prominent, slightly projecting above beyond the eyes, but without cone or tubercle. The male has the hind wings dusky, those of the female are white. The wings are

narrow, outer margin oblique, apex pointed. The male is brownish ochre in color, the female straw yellow; the two rows of brown dots are distinct in both sexes.

Range: Mexico, numerous localities, Gulf States and lower Mississippi Valley.

Grote's *crambidoides* was described from Kansas, so there can hardly be any doubt of the application of the name. Walker's *lincosellus* was described from Honduras, whence I have no material. If the names shall be found to refer to the same form, Walker's name would have priority.

***Diatraea pedidocla*, new species.**

Similar to *D. saccharalis crambidoides*. The females are even narrower-winged, brownish ochre instead of straw yellow, while the outer row of dots runs closer to the margin and anal angle and is darker in color. The fore wings resemble those of male *crambidoides* rather than those of the female. The hind wings are white.

Two females, Cordoba, Mexico, January 27, February 27, 1908 (F. Knab).

Type, No. 13612, U. S. National Museum.

This is perhaps only a dark variety of the female of *crambidoides* Grt.

***Diatraea instructella*, new species.**

A large species resembling *crambidoides*, much larger, the markings coarser, the lines of dots distinct, diffused, almost continuous, the inner line drawn in at its termination almost to the base of the wing. Discal dot distinct, black; terminal dots minute. Hind wing white. The front is smooth, rounded, gently convex.

One female, Popocatepetl Park, Mexico, July, 1906 (W. Schaus).

Type, No. 13613, U. S. National Museum.

***Diatraea magnifactella*, new species.**

Another large species of the *crambidoides* type. Male brownish ochreous, the hind wing dusky, almost blackish; lines of dots on the fore wings distinct, approximated. The wings are rather broad, square at the apices. Female pale straw yellow, the markings much less distinct than in the male. Hind wings soiled yellowish, slightly shaded with fuscous toward anal region. The front is prominent and has a small central cone, the tip of which projects through the vestiture.

Male and female, Orizaba, Mexico, April, 1908 (R. Müller); Male and two females Cuernavaca, Mexico, June and August, 1906 (W. Schaus); one female, Jalapa, two females, Oaxaca, Mexico (Schaus collection).

Type, No. 13614, U. S. National Museum.

Diatraea minimifacta, new species.

A small square-winged species. The wing is darkly shaded through the middle, obscuring the lines, which are sub-continuous and not resolved into dots; veins brown-lined beyond this shade, terminal black dots between the veins with white points before them relieved on the brown ground. Hind wing white. Expanse, 18 mm. The front is smooth and nearly flat.

Two females, Trinidad, British West Indies (Schaus collection, A. Busck).

Type, No. 13615, U. S. National Museum.

Diatraea continens, new species.

Fore wing straw yellow, the veins lined in brown, with faint lines between; two brown oblique parallel lines joining a brown cloud at apex; terminal dots small black, discal dot brown. Hind wing white, nearly pure. Front smooth and nearly flat.

One female, Castro, Parana, Brazil (Schaus collection).

Type, No. 13616, U. S. National Museum.

Diatraea pedibarbata, new species.

Front smooth, rounded, slightly prominent; hind tarsi short, the tibiae with a large tuft of hairs. Dark brown, the lines as usual but not relieved, obscure against the dark ground. Body parts also dark, but hind wing whitish, with only a slight straw-color tinge. Expanse, 23 mm.

One male, St. Laurent, Maroni River, French Guiana (W. Schaus).

Type, No. 13617, U. S. National Museum.

Diatraea canella Hampson.

Diatraea canella Hampson, Ann. Mag. Nat. Hist., (6) XVI, 349, 1895.

This species has a strong frontal prominence in the form of a plate with a point in the center. The general color is reddish gray without any of the straw yellow tint. The dots on the fore wing are larger and less strigose than usual in the *saccharalis* group; they are nearly obsolete in the female, which is of a nearly uniform reddish gray.

Specimens are before me from Grenada, Trinidad and the Guianas. Hampson gives also Brazil, but Brazilian specimens before me are separable specifically. The species feeds on sugar cane in the larval state, as proved by a bred specimen from Mr. F. W. Urich.

Diatraea amnemonella, new species.

Similar to *canella* Hamps., but narrower-winged, the markings more diffused and obscured. The female is gray, like the male, while the hind wings are white in both sexes. The frontal prominence is a central cone, not a plate.

Male and female, Castro, Parana, Brazil (Schaus collection).
Type, No. 13618, U. S. National Museum.

Diatraea zeacolella, new species.

Female with the wings broad, the apex square; color straw yellow, the brown lines on the veins conspicuous, generally more so than the lines between the veins; no bands of dots, or only slight traces of them; terminal dots larger than in *saccharalis*, but yet small, generally present; discal dot black, present.

Male generally larger and somewhat broader winged than *saccharalis*, the same specific differences present as in the female, but in lesser degree; the two bands of dots are present, but are not intensified by dark shades; the linings on the veins are more contracted than in *saccharalis*.

Types, five males and nine females, Tryon, North Carolina, April 4, June 2, August 2 and 9, 1904 (W. F. Fiske); Ninety-six Post Office, South Carolina, larvae received July, 1880, issued May 9, 1881 (W. L. Anderson); Fredericksburg, Virginia, issued July 26, 1890 (Dept. Agr., No. 1015P); Alexandria County, Virginia, larvae in *Thripsacum dactyloides* July 15, 1891, adults issued August 13 and 21, 1891 (T. Pergande).

Type, No. 13556, U. S. National Museum.

The figures published by Dr. Howard of the "larger corn-stalk borer." (Insect Life, iv, 95, 1891) represent *D. zeacolella*.

This species is transitional toward the next group, the males having the markings of the *saccharalis* group, whereas the females considerably resemble *lineolata* Walker.

Iesta lisetta Dyar.

Iesta lisetta Dyar, Proc. Ent. Soc. Wash., XI, 29, 1909.

This little species has the straw-colored wings and rows of dots characteristic of the *saccharalis* group and also the essential generic character of the union of vein 11 with 12. But vein 10 is stalked with 8 and 9, and it is therefore necessary to remove the species from *Diatraea*, as I have done.

§ 2. *Lineolata* group.**Diatraea lineolata** Walker.

Leucania lineolata Walker, Cat. Brit. Mus., IX, 100, 1856.

Crambus impersonatellus Walker, Cat. Brit. Mus., XXVII, 163, 1863.

Chilo neuricellus Zeller, Mon. Chil. & Cramb., 8, 1863.

The front has a distinct cone, across which runs a transverse ridge. The fore wings are brownish or straw color, the veins brown with brown lines between, not strongly contrasted; terminal dots absent or minute; discal dot often absent.

There is a lightening of the ground color in the interspaces beyond the cell, forming a faint pale ray outwardly from the discal dot, which is never very distinct, but gives a characteristic appearance. Hind wings soiled white in the male, with only a faint yellowish tinge in the female.

We have this species from Cuba, Trinidad, the Guianas, Venezuela, Costa Rica, Mexico and southern Arizona, all without any marked variation or tendency to local forms, except that in the northern end of its range there is a tendency to the loss of the frontal prominence. It is absent in a male from Tehuacan before me, in a female from Cuernavaca and in the single female from southern Arizona. This is not a fixed local character, as other specimens from the same places, indistinguishable in color, possess the frontal prominence.

Diatraea culmicolella Zeller.

Chilo culmicolellus Zeller, Mon. Chil. & Cramb., 7, 1863.

This was described from Colombia, and said to differ from the preceding only in the obsolescence of the linings and discal dot. I have no specimens from Columbia, so let the name stand, but I think it will be found to be the same as *lineolata* Walker.

Diatraea grandiosella, new species.

A single large female differs from the series of *lineolata* in its brownish color, without any yellow tint. The linings on the veins and between are very distinct; terminal dots minute, black; discal dot obsolete. The front is smooth, without prominence. Hind wings soiled white.

One female, Guadalajara, Mexico (Schaus collection).

Type, No. 13619, U. S. National Museum.

This may be a variation of *lineosella*, but it does not match any in the series. In *lineolata* when the veins are strongly lined the intravenular streaks are less strongly marked. In *grandiosella*, all are alike, heavily marked.

Diatraea pallidistricta, new species.

Front conically protuberant, but without any point or ridge. Wings as in *lineolata*, the linings indistinct and blurred, the whitish discal ray strong, broad and contrasted. Discal dot minute; terminal dots absent. Hind wing white.

One female, São Paulo, Brazil (Schaus collection).

Type, No. 13620, U. S. National Museum.

Diatraea angustella, new species.

The front is smooth, roundedly protuberant. Wings narrow, pointed at apex, much as in *lineolata* but darker, the veins strongly relieved in brown, the intervenular streaks broad and diffused, sometimes entirely filling the spaces between the veins. No terminal dots. Discal dot small, sometimes absent. Hind wings white, slightly soiled in the male, faintly yellowish in the female.

Two males, ten females, Castro, Parana, Brazil (Schaus collection).

Type, No. 13621, U. S. National Museum.

Diatraea bellifactella, new species.

Front with a cone and transverse chitinous ridge. Wings moderately broad, the apices depressed. Pale straw color, the veins strongly lined in brown; a brown shade from apex towards end of cell, in the male continued across wing by thickenings of the lines on the veins; an outer parallel row of thickenings oblique from middle of outer margin to middle of inner margin; streaks between the veins linear, not distinct; discal and terminal dots small, blackish. Hind wing soiled white in both sexes.

Male, São Paulo, Brazil; female, Castro, Parana, Brazil (Schaus collection).

Type, No. 13622, U. S. National Museum.

***Diatraea strigipennella*, new species.**

Chilo strigipennellus Hampson, MS.

Front with conical prominence with chitinous point at tip. Markings as in *lineolata*, but gray and brown, without straw color. In the male two faint curved parallel shaded lines. The pale discal ray is fairly conspicuous.

Specimens are before me from the Guianas and Brazil, including a female cotype from Castro, Parana.

Type, No. 13623, U. S. National Museum.

Sir G. F. Hampson writes that he suppressed his description of this species, having concluded that it was the same as *D. lineolata* Walk. It is, however, smaller, and gray, not yellow, while the males are narrower-winged and have the two parallel curved lines well shown.

***Diatraea berthellus* Schaus, new species.**

"Fore wing with the costal portion ochreous brown, shading to yellow costally; a silvery white ray from base to outer margin, widening outwardly and diffused below; a gray area below this; inner margin broadly light yellow at base, the yellow shading into the gray outwardly and lost before the anal angle; a row of terminal black points; fringe metallic. Expanse, 20 mm.

Castro, Parana, Brazil," Schaus, MS.

Type, No. 13624, U. S. National Museum.

The front has a thick cone with sharp chitinous point. The species is wholly unlike the *Diatraea* species here discussed, and is, I think, not properly referable to *Diatraea*, but rather to *Chilo*. It is true that in the type vein 11 makes a short anastomosis with 12, but in the other three specimens it runs free, though very close to 12. The majority of the specimens have the vein free as in *Chilo*, while in the type itself there is only a short anastomosis, not a complete union of the veins as in *Diatraea*. The species resembles the North American *Diatraea parallela* Kearfott, but that is a typical *Diatraea* with flat front.

Crambus faunellus Schaus, new species.

"Fore wing straw yellow, shaded slightly with brown towards inner margin; veins faintly bordered with brown on each side; a brown discal dot, one below on vein 2 and a slight one at anal angle. A row of terminal black dots between the veins. Hind wings slightly shaded with brown except along costa; fringe pale on both wings. Expanse, 31 mm.

Sao Paulo, Brazil." Schaus, MS.

Type, No. 13625, U. S. National Museum.

The front is smooth, antennae of the male slightly thickened and flattened, fore wing with vein 7 given off further from the apex than 9, 11 curved and approximated to 12, 4 and 5 stalked. This brings it in the group with *distictellus* Hampson, than which it is much larger and has a terminal row of black dots on fore wing. I mention this species here because the females were included under *Diatraea lineolata* in the collection, to which they bear a strong superficial resemblance. They differ from the male only in having the wing slightly more pointed, the linings along the veins a little more distinct, while the spots are less distinct, and the hind wings are paler, being a slightly soiled white.

A Supposed Occurrence of *Anagrus incarnatus* Haliday in the United States (Hym.).

By A. A. GIRAULT Urbana, Illinois.

Sometime during 1909 I received from Professor C. P. Gillette, of the Colorado Agricultural College, a slide bearing single specimens of both sexes of a species of *Anagrus* Haliday, with the request that I identify it if possible. The slide was labelled "probably from eggs of *Aphis pomi*." Soon after its receipt I examined the specimens and decided that they could not be separated from *Anagrus incarnatus* Haliday, specimens of which I have as a loan through the ready kindness of Dr. L. O. Howard. Subsequently, however, a more careful comparison showed differences of such character as to preclude the sameness of the two sets of specimens and the Colorado specimens are therefore representatives of an undescribed species. At the present time Mymarids of the Euro-

pean fauna do not occur in this country; that is to say so far as is known. Species of *Anagrus* are common here as are also species of other common genera but I have never met with a specimen which was similar to any of the European specimens in my possession.*

The new North American species which I shall call *Anagrus spiritus* is similar in all details of body structure, color, antennae and wing ciliation to *incarnatus* but differs in the following particulars: The marginal cilia of the posterior wings at the caudal margin are very long, the longest being seven or eight times longer than the greatest width of the wing blade, distinctly longer than in *incarnatus*—in that species only four or five times longer than the greatest width of the wing blade; otherwise the posterior wings are alike in both species. In the American species the parapsidal furrows are farther apart, in other words the mesoscutum is broader, much broader cephalad than its width at the caudal margin, the parapsidal furrows curving cephalo-laterad: in *incarnatus* the parapsidal furrows are but slightly curved cephalo-laterad, comparatively straight, consequently the mesoscutum is nearly rectangular but slightly broader at the cephalic margin than it is broad at the caudal margin and distinctly longer than wide, wedge-shaped. In *spiritus* it is only slightly longer than its greatest width, its caudal margin curved, its shape peltate. In *incarnatus* the caudal margin of this sclerite is nearly straight, slightly concaved. The fore wings in both species are nearly identical in shape, yet in *spiritus* they are slightly broader at the apex, with the tendency to bear one more line of discal ciliation (7 or 8 lines) and with longer marginal cilia. The antennae in both are very much alike, yet in the female the joints though similar in shape, yet are shorter in *spiritus* than in *incarnatus*, so that the sixth funicle joint is barely longer than the first; whereas in *incarnatus* it is distinctly longer than

*I may add that the differences between the species of *Anagrus* are more subtle than those met with in any other group; they are distinct enough when once seen.

the first funicle joint by at least a fourth. In *spiritus* the cephalic femora are slightly longer and broader than in the other species, as long as the cephalic tibiae. There are no colorational differences between the two species, excepting that in *incarnatus* (female only) the pedicel and first funicle joint of the antenna are pallid (white, clear), not so in *spiritus*. The species is described more in detail herewith.

Anagrus spiritus species nova.

Female:—Length, 0.65 mm.; moderately small for the family, usual in size for the genus.

General color yellowish brown (brown pink) suffused with some dusky, the abdomen with 4 or 5 transverse dusky bands across it which are not conspicuous; all appendages pallid brownish as is also the venation; the trochanters and knees pallid, the wings hyaline excepting the fore wings proximad which are suffused with dusky out as far a distance distad of the apex of the marginal vein as the latter is long, the fumation more noticeable caudad of the marginal vein. Eyes and ocelli ruby red.

Carina on the vertex present, usual; eyes reniform; abdomen slightly longer than the thorax, pointed but not noticeably or pronouncedly so.

Fore wings moderately slender, clavate, curved at about the distal third, with very long marginal cilia, the longest about twice longer than the greatest wing width (some distance back from the apex), shortening abruptly along both margins proximad of the distal third, there half shorter and from thence proximad more gradually shortening. Discal ciliation of the fore wing arranged across the widest part in about 6 longitudinal rows and between the fifth and sixth row in that part of the blade is a narrow, long elliptical bare space. Marginal vein about four and a half times longer than wide, terminating in a blunt point away from the cephalic margin and bearing three long setae. Dilatation of the fore wing caudad near base conspicuous, opposite the marginal vein. Posterior wings without discal ciliation excepting the paired row along each edge arising from between the bases of the marginal cilia.

Tibial spurs short, straight, single; none of the four tarsal joints are long; cephalic tibial spurs usual, that is longer, curved, forked at tip forming the usual strigil. Valves of ovipositor distinctly projecting a short distance beyond the end of the abdomen.

Antennae 9-jointed; scape one and a half times longer than the ped-

icel, the latter obconic, very much larger than the first funicle joint. The latter nearly globular, small, only a third the length of the second funicle joint which is the longest joint of the funicle; funicle 3 slightly shorter, 4 still somewhat shorter but widening distad; 5 and 6 subequal, slightly longer than the preceding. Club ovate, as long as the combined lengths of funicle joints 5 and 6, longer than the scape. (From 1 specimen, two-thirds inch objective, 1-inch optic, Bausch and Lomb).

Male:—The same but the abdomen is blunt at tip.

Antennae 13-jointed, filiform; joints of the flagellum gradually lengthening distad but funicle 1 is a third shorter than funicle 2; funicle 2 to 5 subequal; 6 to 9 subequal, slightly longer; 10 to 11 equal, very slightly longer; pedicel shorter than the first funicle joint. (From 2 specimens, the same objective and optic).

Described from two male and one female specimens, a pair first received from Professor C. P. Gillette mounted on a single slide labelled "Parasites found on apple twigs. Probably from eggs of *Aphis pomi*, 1904, S. A. J." The third specimen, a male, was received from Dr. E. P. Felt, of the New York State Museum and State Entomologist of New York, also mounted on a slide labelled, "a 1456, E. Schodack, 24, Apr., '07."

Habitat: United States—Colorado, New York (E. Schodack).

Types: Accession No. 40,809, Illinois State Laboratory of Natural History, Urbana, Illinois, one male and one female mounted on a single slide in balsam. *Cotype*—Cotype No. 13,650, United States National Museum, Washington, D. C., one male on a slide in balsam (New York).

This species is distinguished from the common species of the genus as I find them in Illinois by its unusually long ciliation of the wings and the finer, more delicate appearance of this ciliation.

Postscript: Dr. E. P. Felt has stated to me in a letter that the male specimen received from him, as previously written above, was reared from the galls of *Dasynectura serrulata* O. S., taken on alder at East Schodack, New York, March 29, 1907, the parasites emerging the 24th of April following.

New Records of Bees : *Sphecodes* and *Prosopis* (Hym.).

BY JOHN H. LOVELL, Waldoboro, Maine.

Sphecodes persimilis Lov. & Ckll.

♀.—Hampton, N. H., Sept. 12, 1909, S. A. Shaw. The specimen is a little smaller than the type, but otherwise is characteristic. The type is an unusually large bee for this genus, as it is nearly ten millimeters in length.

Sphecodes ranunculi Robt.

♀.—Hampton, N. H., June 25, 1908, S. A. Shaw; also both sexes from Elkhart, Ind., R. J. Weith. When a bee is monotropic or oligotropic, the use of the generic name of the flower, which it visits, as a specific name for the insect is, at least, descriptive and may offset the objection to a noun in the genitive; but when the bee is polytropic such names are misnomers and should be avoided.

Sphecodes confertus Say.

♀.—Hampton, N. H., May 10 and 30, S. A. Shaw. Specimens of both sexes have been collected by R. J. Weith at Elkhart, Ind.

Say states that this species was collected in Indiana. While his description is very brief and indefinite, he mentions twice that the punctures are "dense" and twice that they are "close set," a degree of punctation which applies to the mesothoracic disc of *S. falcifer* Patton much better than to that of *S. arvensis* of the same author. In the latter species the punctures are rather small and far apart, and the whole disc is smoother and more shining. *S. confertus* appears to be identical, therefore, with *S. falcifer*. The Indiana specimen before me, referred to *S. confertus* Say, has the disc of the mesothorax very densely and closely punctured so that it is nearly opaque. The female of *S. falcifer* Patton, according to the description, has the mandibles "unarmed" and the "labrum deeply emarginate." The Indiana specimen has simple mandibles and the long

labrum is notched at the apex. There seems to be no other species with which *confertus* can be identified, and I would, therefore, regard *S. falcifer* Patton as a synonym of *S. confertus* Say.

***Sphecodes shawi* sp. nov.**

♀.—Length 6 mm. Head and thorax black; abdomen red, the apical segments tinged with black. Face finely and densely punctured, clothed with pale buff-colored pubescence; clypeus with large dense punctures; mandibles simple, red, the apices darker. Antennae black, the flagella largely red. The disc of the mesothorax finely and rather sparsely punctured, shining. Wings dusky hyaline, nervures and stigma dull ferruginous; tegulae partially red; the second submarginal cell is extremely narrow, the distance between the 1st and 2nd transverse cubital nervures not much exceeding the width of the basal nervure. Legs black, clothed with buff-colored, plumose hairs, the apical tarsi red, exteriorly on the center of each hind tibia there is a long red spot. The enclosure on the disc of the metathorax is not well defined, coarsely reticulated. The abdomen is impunctate except for minute hair punctures.

One specimen from Hampton, N. H., June 8, 1909, S. A. Shaw. In a part of its characters this species resembles *S. pimpinellae* which has the second sub-marginal cell very short, but the latter has the mandibles bidentate, the tegulae, tibiae and tarsi red, and is 7 mm. long. The species is dedicated to Mr. S. A. Shaw, a most diligent collector of the insects of New Hampshire, and whose specimens are more carefully mounted than any others I have ever had the privilege of examining.

***Sphecodes heterus* sp. nov.**

♀.—Length 5 mm. Head and thorax black; abdomen red, 4th and 5th segments black. Face densely and finely punctured, clothed with grayish-white pubescence; mandibles red with darker apices, bidentate; labrum long with an apical median groove; clypeus with a few sparse punctures. Antennae black, flagella brownish in front. Mesothorax shining, with rather small, sparse punctures. Wings hyaline, iridescent, nervures and stigma dark brown; tegulae testaceous. Legs black, tarsi largely dark. Enclosure on disc of metathorax large and well defined, finely reticulated, rugae small. First abdominal segment nearly impunctate, 2nd and 3rd finely punctured at extreme base.

Hampton, N. H., Sept. 9, 1909, S. A. Shaw. This species is allied to *S. levis*, but differs in the hyaline wings and the sculpturing of the metathorax; in *S. levis* the ridges are parallel.

***Sphecodes paraplesius* sp. nov.**

♀.—length $3\frac{1}{2}$ mm. Head and thorax black; abdomen red, apical segments black. Face closely and very finely punctured; mandibles yellowish-red, apices darker; clypeus shining with a few sparse punctures. Antennae black, flagella reddish. Mesothorax smooth and shining, with fine, sparse punctures. Wings hyaline, the margins clouded with dusky, nervures and stigma dark brown; tegulae reddish testaceous. Enclosure on metathorax distinct, finely reticulated. Abdomen impunctate, segments 1-3 bright red, the apical margins with yellowish reflection; apical segments black,

Kingston, R. I., June 10, received from Professor John Barlow. This species and *S. banksii* are the two smallest species of *Sphecodes* known to me. The resemblance between them is so close that I should be inclined to refer them to the same species were it not for the fact that the mandibles of *S. banksii* are simple and those of *S. paraplesius* are distinctly bidentate, which according to some taxonomists would place them in different genera. In an attempt to segregate the genus *Sphecodes* into a number of minor genera, the dentition of the mandibles has been employed as a generic character; but it does not appear well adapted for this purpose since it would separate species apparently very closely allied.

***Sphecodes arvensis* Patton.**

♀.—Elkhart, Ind., R. J. Weith. This species is closely allied to *S. dichrous* Sm.

***Sphecodes illinoensis* Robt.**

♀.—Elkhart, Ind., R. J. Weith. A small species with simple mandibles; enclosure on metathorax with parallel ridges.

***Prosopis telepora* sp. nov.**

♀.—Length 4 mm. Face marks pale yellow, elliptical; the upward extensions tapering to a narrow streak along the eye margin; tubercles nearly white, collar and tegulae upspotted; tibiae in front more or less

yellow, tarsi dark. Face closely and finely punctured; clypeus impunctate except for a few minute hair punctures, marked with very fine longitudinal striae. Antennae black, flagella chestnut brown behind. Disc of mesothorax finely and very closely punctured. Wings nearly hyaline, nervures and stigma chestnut brown; tegulae black. Enclosure on metathorax well defined, with about six, short parallel rugae, the apical half without ridges but marked with minute, irregular, transverse striae. Abdomen broadly oblong, finely punctured all over, the lateral apical margins of segments 1-3 with thin fasciae.

♂.—Length 4 mm. Clypeus, supraclypeus and sides of face lemon yellow; the lateral face marks are obliquely truncated opposite the sockets of the antennae, and from the center of each there extends perpendicularly upward a narrow stripe, sometimes slightly enlarged at the end; the supraclypeal mark is longer than wide and terminates in an unnotched point between the antennae. Collar and tegulae unspotted; the tubercles are largely pale yellow; the tibiae at base exteriorly and the tarsi are yellow.

One female, May 31, and two males, April 9 and May 29, North Carolina, Southern Pines, A. H. Manee. A stout, little bee, not closely allied to any other species.

Prosopis melitina sp. nov.

♀.—Length $7\frac{1}{2}$ mm. A large robust bee only surpassed in size among New England species by *P. basalis*. Black; the lateral face marks irregularly triangular, the upward extensions narrow, obliquely truncated opposite the eye sockets, lemon yellow. Collar and tegulae black; yellow spots on tubercles; anterior and intermediate legs black, but base of posterior tibiae pale yellow; tarsi dark brown. Face and mesothorax closely and rather coarsely punctured, nearly opaque. Antennae wholly black. Clypeus with large, indistinct, shallow punctures. Wings nearly hyaline, their margins slightly clouded with fuscous, nervures and stigma dark brown. Enclosure of metathorax well defined, coarsely reticulated. Abdomen oblong, stout, nearly smooth, with white apical fasciae on the extreme lateral margins of the first segment; segment 1 with microscopic hair punctures, punctures on segments 2 and 3 coarser but very fine.

Hampton, N. H., July 4, 1907, S. A. Shaw.

Prosopis ziziae Robt.

Female, August 20, male, July 19 and Sept. 5, Hampton, N. H., S. A. Shaw.

Prosopis pygmaea Cr.

Male, June 8 and July 19, Hampton, N. H., S. A. Shaw.

Prosopis variifrons Cr.

Female, July 19; male, June 6, Hampton, N. H., S. A. Shaw.

Prosopis modesta Say.

The female was taken June 25, the males, July 19 and Sept. 6, at Hampton, N. H., by S. A. Shaw. One of the males has the first abdominal segment faintly and sparsely punctured all over; but in two other specimens the disc of the first segment is impunctate. The characters of this species are very well shown in a male and female from Washington County, Wisconsin, received from Dr. Graenicher.

The Occurrence of the Mymarid Genus *Anaphoidea* Girault in England (Hymen.).

BY A. A. GIRAULT, Urbana, Illinois.

In a collection of beautifully prepared slide mounts of British Mymaridae, loaned to me for study by Dr. L. O. Howard, I found a pair of specimens labelled *Eustochus atripennis* which, upon more recent examination, were found to represent a species of the genus *Anaphoidea* and hence wrongly identified and labelled. The fact that these specimens were not *Eustochus* had been brought to my attention separately by both Dr. Howard and Mr. Fred. Enock, of London, more than two years ago, but their letters had been mislaid and were not found until I had reached the same conclusion independently. The specimens represent a new species which is described herewith.

Anaphoidea diana sp. n.

Female.—Length, 0.65 mm. Moderately small; normal.

Similar to the other three species of the genus but at once distinguished from the type species in being smaller, the funicle joints of the antennæ shorter, the second funicle joint of the antenna distinctly

shorter than the third, not more than twice the length of the first, in having slightly narrower fore wings and in being brown* instead of black. From *conotracheli* it differs first in being brown in color, secondly and of more importance, in having a shorter second funicle joint, not *slightly* but *distinctly* shorter than the third, also narrower and in having from 8-14 cilia in the midlongitudinal line of the posterior wings nearly as in *sordidata*. From the species *pullicrura* it differs also in being brown in color but more noticeably, as in *conotracheli*, in having the proportionally shorter second funicle joint, the longer midlongitudinal line of discal cilia in the posterior wings; also slight-broader fore wings (from 10-13 longitudinal lines of discal cilia across the widest blade portion). The male is similar to the female excepting the secondary characters of sex.

The following details are all considered necessary to add here: Color uniformly brown, the abdomen darker, the antennæ and tibiæ somewhat lighter, the trochanters, knees, tips of tibiæ and proximal three tarsal joints pallid yellowish; distal joint of club longer than the other.

Male.—The same. Antennæ 12-jointed, normal; funicle joints shorter than in *sordidata*, nearly as in *conotracheli*.

Described from one male and one female mounted in balsam on separate slides, each slide labelled, "Fred. Enock, Preparer. Order Hymenoptera, Family Mymaridae, Genus *Eus-tochus*, Species *atripennis*. ♂ (or ♀). A Fairy Fly. Spot lens 2-inch to 1/2-inch."

Habitat.—England (London or vicinity?).

Types.—Type No. 13,663, United States National Museum, Washington, D. C.

One male, one female in balsam, two slides.

At the Massachusetts Agricultural College Dr. Guy Chester Crampton has been appointed associate professor of entomology. Dr. Crampton is a native of Alabama. He graduated from Princeton in 1904, took two years of graduate work at Cornell University, receiving his M.A. there in 1905, followed by two years at the universities of Freiburg, Munich and Berlin, where he received his Ph.D. in 1908. He was an instructor in biology at Princeton from 1908 to 1910 and since the summer of 1910 has been professor of zoology at Clemson College.—*Science*.

* It must be taken into consideration that the specimens have been in balsam for many years and may have faded from black to brownish

A new Coccid on *Ledum* (Hemip.).

BY T. D. A. COCKERELL, Boulder, Colorado.

I have just received from Dr. E. P. Felt a small Dactylopiine Coccid collected on small twigs of *Ledum groenlandicum* (fam. Ericaceae) at Sand Lake, N. Y., July 14, 1910. To my astonishment, it proves to belong to that section of *Pseudococcus* represented by the widely-spread tropical *P. filamentosus* (Ckll.) and *P. hymenocleae* (Ckll.) of the Arizona desert country. *Ledum groenlandicum*, according to Britton, occurs from Greenland to British Columbia, Massachusetts, New Jersey and Wisconsin. *Pseudococcus ledi* is very much like *P. filamentosus*, but differs in various details; the most noticeable peculiarity is the hump near the base of the tibia on the outer side. The legs and antennae are very short and stout. The microscopic measurements are in microns.

Pseudococcus ledi n. sp.

♀.—Length about 2 mm., broad oval, densely covered with mealy secretion, which is strongly tinged with pale yellow; on boiling in caustic potash the insect appears dark blue-green, but the skin is colorless and transparent; antennae and legs very pale brown; antennae short and stout, first joint very large, last joint with both hairs and curved spines, as in the genus *Rhizococcus* (cf. Newstead, British Coccidae, vol. 2, pl. LXIX. f. 8); antennae 7-jointed, the joints measuring (1.) about 50 long, (2.) about 28 long and 30 wide, (3.) 25 long, (4.) 25 long, (5.) 20 long, (6.) 25 long, (7.) 63 long and 23 wide; terminal hairs of seventh joint about 28 long; so-called mentum dimerous, not elongated, about 120 long and 85 wide at base, its bristles very small; anal ring with six stout bristles, about 158 long; caudal lobes low, with bristles little longer than those of anal ring, and the usual round glands and short spine-like structures; legs very short and stout, claw stout, with a rudimentary denticle or protuberance near the base, not always evident; claw digitules well knobbed; femur with trochanter about 163; tibia about 75, humped near base; tarsus (excluding claw) about 53; width of femur 53.

MR. ROLAND TRIMEN, F. R. S., well-known for his work on South African Lepidoptera was recently the recipient of the Darwin Medal of the Royal Society of London.

Additions and Corrections to "The Genotypes of the Sawflies and Woodwasps, or the Superfamily Tenthredinoidea" (Hymen.).

By S. A. ROHWER, Bureau of Entomology, U. S. Department of Agriculture, Washington, D. C.

In the paper above quoted, published as Part 2, Technical Series No. 20, Bureau of Entomology, United States Department of Agriculture, March 4, 1911, certain corrections and additions are necessary.

A careful study of Panzer's "Faunæ Insectorum Germanicæ initia, oder Deutschlands Insecten gesammelt und herausgegeben," discloses the fact that some of the genera were described earlier than they had heretofore been supposed to have been. The results of this study make certain changes necessary. Certain generic names heretofore overlooked are also added. To make the work complete, with the corrections, the species should be added to the list of genotypes.

P. 73. Replace *Allantus* as it is with:

Allantus Panzer, Fauna. Insect. German. VII p. 82, T. 12, 1801.

Type: *Tenthredo* (*Allantus*) *togata* Panzer, Monobasic.

P. 74. Accredit **Astatus** to Panzer not Jurine.

P. 76. Insert following *Celidoptera*:

Cepha Billberg, Enumeratio Insectorum p. 98, 1820.

Type: *Sirca* *tibida* Fabricius (Monobasic).

=**Trachelus** Jurine (isogenotypic).

P. 76. Replace *Cephalcia* as it is with:

Cephalcia Panzer, Fauna. Insect. German. VIII p. 86, T. 9, 1805.

Type: *Cephalcia* *arvensis* Panzer.

=*Tenthredo* *signata* Fabricius.

Insert following *Cephalcia*:

Cephalcia Jurine, Nouv. Method. Class. Hym. p. 68, 1807.

Type: *Cephalcia* *arvensis* Panzer.

=*Tenthredo* *signata* Fabricius.

=**Cephalcia** Panzer, Isogenotypic.

P. 77. Insert following *Corynophilus*:

Cristiger Gistel, Naturgeschichte des Thierreichs p. 144, 1848.

Type: *Diprion* *pini* (Linnæus), Monobasic.

=*Diprion* Schrank. Isogenotypic.

P. 77. Strike out "**Nematus** Jurine" following *Croesus* Leach. *Croesus*, Leach is a good genus.

Replace *Cryptus* as it is with:

Cryptus Panzer, Fauna. Insect. German. VIII p. 88, T. 17, 1805.
(non Fabricius 1804.)

Type: *Cryptus segmentarius* Panzer, Monobasic.

=**Arge** Schrank.

P. 78. Replace *Dolerus* as it is with:

Dolerus Panzer, Fauna. Insect. German. VII p. 82, T. 11, 1801.

Type: *Tenthredo (Dolerus) pedestris* Panzer.

=*Tenthredo pratensis* Linnaeus.

P. 79. Following *Emphytus* insert:

=**Allantus** Panzer.

Insert following *Erythraspides*:

Eudryas Gistel, Naturgeschichte des Thierreichs, p. viii, 1848.

n. n. for *Cladius* Rossi (not *Cladium* Schrader in plants).

=**Cladius** Rossi.

P. 80. After *Holcocneme* Konow insert:

=**Nematus** Panzer.

P. 84. Replace *Nematus* as it is with:

Nematus Panzer, Fauna. Insect. German. VII p. 82, T. 10, 1801.

Type: *Tenthredo (Nematus) lucida* Panzer, Monobasic.

P. 87. Following *Pocillosoma* add:

not Hübner 1816; not Stephens 1829, etc.

P. 87. Insert following *Polystichophagus*:

Polytaxonus MacGillivray, Can. Ent. vol. 40, p. 368. 1908.

Type: *Taxonus robustus* Provancher (designated).

P. 88. Insert following *Probleta*:

Prosecria Gistel, Naturgeschichte des Thierreichs p. X, 1848.

n. n. for *Pocillostoma* Dahlbom.

=**Empria** Lepelletier.

Replace *Pteronus* as it is with:

Pteronus Panzer, Fauna. Insect. German. VIII p. 87, T. 17, 1805.

Type: *Tenthredo pini* Linnaeus, Monobasic.

=**Diprion** Schrank, Isogenotypic.

P. 89. Insert following *Spaecophilus*:

Sterictiphora Billberg, Enumeratio Insectorum p. 99, 1820.

Type: *Hylotoma furcata* Fabricius (designated, monobasic).

=(**Schizocera** Lepelletier 1828, isogenotypic).

P. 99. The remarks about *Croesus* Leach being a synonym of *Nematus* are incorrect. *Nematus* must date from Panzer 1801, where it is monobasic and will replace *Holcocneme* Konow. The remarks under *Nematinus* Rohwer are not in accord with these findings, but since *Nematus* Panzer must replace *Holcocneme* Konow, *Nematinus* Rohwer still replaces *Nematus* Konow.

P. 101. For Schultz read Schulz.

A New Variety of *Chionobas*.

By HENRY SKINNER, M.D., Philadelphia, Pa.

Chionobas alberta oslari n. var.

Male expands 41 mm. and the female 45 mm.

Male.—Primaries: Upperside smoky brown with a wide reddish-brown band crossing the wing from near the costa to the inner margin, broken into quadrate spots by the nervures. On the first and third of these are distinct black spots or points and sometimes a faint black point on the central quadrate spot.

Primaries.—Underside yellowish brown with the upper and lower black point repeated; a black line extends from the costa to the inner margin, running parallel to the end of the discoidal cell, then bends inwardly to the lower point of the cell and thence to the inner margin. The outer end of the cell is black.

Secondaries.—Above smoky brown with margins edged with fuscous and a distinct black spot near anal angle. Below marbled with black and white with two black parallel stripes or lines crossing the wing from the costa to the inner margin; they commence near the middle of the costa about 5 mm. apart. The females are similar in markings to the males.

This variety is larger than any *alberta* I have seen. In color and markings on the upper side it very much resembles *C. katahdin*. On the under side it is the exact counterpart of *C. alberta*. It probably expresses the relationship between a mountain and a plains form. Described from two males and two females taken by E. J. Oslar in Deer Creek Canyon, Colorado, September 25, 1909. Types in collection of the Academy of Natural Sciences of Philadelphia.

COLIAS BEHRI.—From observations which I made, I am inclined to believe that the natural haunts of these Alpine insects is in the high Southern Sierras and that * * * Mt. Lyell (Middle Sierras) is practically their northern range. They are not uncommon at altitudes above 10,500 feet in the Southern Sierras (you can almost say that you have reached this altitude by the abruptness with which they commence there) and may be seen on pleasant days—the usual thing there—in early July, flitting from place to place along the meadow-like margins of the Alpine streams and lakes (no true meadows are there—it has too recently recovered itself from the ice cap). I neglected to trace a female to find the food plant, but believe that it must be a species of alpine lupine, as that was the only leguminous plant there and it was quite abundant.—EDWIN C. VANDYKE, San Francisco, California.

A new Gomphus (Odonata).

By RICHARD A. MUTTKOWSKI, Public Museum, Milwaukee,
Wisconsin.

Gomphus brimleyi sp. nov.

Colors olivaceous green and brown on head and thorax, yellow and black on abdomen.

♂.—Face olivaceous green, a line of pale brown at the upper end of the labrum and on the suture of nasus and frons; otherwise immaculate. Frontal ridge narrowly edged with yellow. Vertex black, the postocellar ridge each side with a rounded spot above the lateral ocellus, the two spots connected by a fine line of green. A ring of white around the base of each antenna. Occiput olive, flatly curved. Head yellow behind, a vague black stripe from the occipital edge of the eyes to the foramen, which is narrowly margined with black.

Prothorax brown above, the anterior edge lined with olivaceous green; a median geminate dorsal spot, a latero-dorsal and latero-inferior spots of olive. Posterior lobe short, straight, olive, the extreme edge lined with brown.

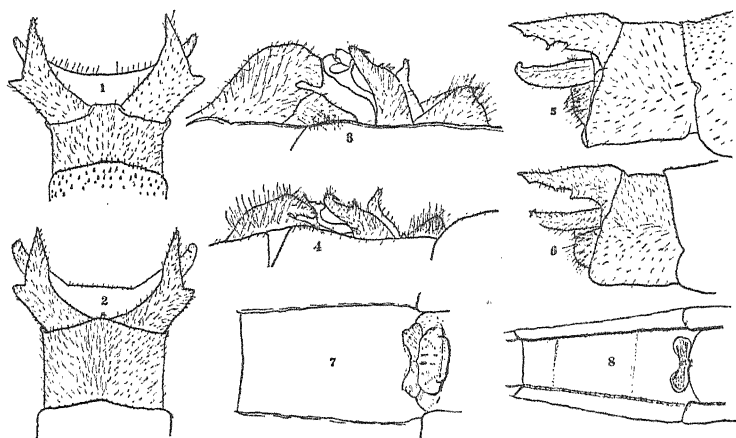
Thorax olivaceous green, marked with brown. Dorsal carina pale, a stripe of brown on each side, both coming together to a point at the antealar sinus, each stripe widening in front to twice the width at the carinal spine, but not reaching the olive collar. Antehumeral brown, narrowed above to a point, separated from the humeral by a pale stripe one half its width. Humeral as wide as the antehumeral, but widening above to twice the medial width. Sides with a stripe of brown on the first and second lateral sutures, the first as wide as the antehumeral, the second half as wide; each extending in a fine sutural line to the coxae. Interalar spaces olive, the wing bases tipped with yellow. Legs brown, the femora beneath and the tibiae externally, olivaceous; Tarsi uniformly brown, except the first and second joints of the hind tarsi, which have a superior yellow line.

Abdomen black and yellow, olive at the sides on the basal segments. Dorsum with a well-defined line of yellow on 1 to 8, $\frac{1}{2}$ mm. wide, growing brighter yellow toward the apical segments, interrupted narrowly at the joints. The line ends on 8 at two-thirds in an elongated triangle, which is continued to the apex of the segment in a very narrow line. Segments 7-9 with the extreme apex edged with yellow. Sides of 1-2, and 3 basally, with lower half olivaceous yellow, 4-6 with indeterminate yellow laterally, 7-10 with inferior half bright yellow. Segment 9 black above, 10 brown. Appendages brown, black at tips.

Appendages as long as 10. Superiors divaricate, externally truncate, an inner triangular prolongation one half the length of the appendage.

Inferiors slightly shorter, straight, the extreme apex upturned. Viewed laterally, the superior appendage angled at one half, then emarginate to three fifths, a small tubercle at the distal end of the emargination, an obtuse angle shortly before the acute apices.

♀.—Similar to the male. Occiput very flatly trilobed, the median lobe occupying the middle two fourths. Abdomen with more yellow on the sides, 10 with a vague line of yellow above. Vulvar lamina very short, one eighth the length of 9, emarginate, the lobes somewhat rounded.



Gomphus cavillaris Needham, ♂ ♀, figs. 1, 3, 5, 7.

" *brimleyi* n. sp., ♂ ♀, figs. 2, 4, 6, 8.

Wings hyaline, stigma rufous, costa green. Antenodals, fore wings 9-10, hind wings 7-8. Postnodals 6-7 on all wings. Rows of cells beyond triangle in fore wing extremely variable, some specimens having only one row to close to the level of the nodus, others having two complete rows, while some are intermediate.

Abdomen. ♂ 26-27 mm., ♀ 24-27 mm. Hind wing: ♂ 20-22 mm., ♀ 21-22 mm.

Described from four males and three females, all from White Lake, Bladen Co., North Carolina, mid-April, 1910, sent to me by Mr. C. S. Brimley. ♂ holotype, ♀ allotype, and paratype ♂ and ♀ in collection Milwaukee Public Museum. The remaining three paratypes in collection Brimley.

In a recent letter Mr. Brimley writes: "The *Gomphi* were all collected by Mr. Franklin Sherman, our State Entomologist, in open pine woods, near the banks of White Lake in Bla-

den County. He says that they frequented the more open spots in the woods, settling on the ground. Years ago he and I collected some of the same species at Lumberton, along the banks of the Lumber River and in the adjoining mixed woods. These last acted in the same manner as *G. exilis* and *sordidus*; that is to say, they kept in the woods, settling on the ground in open spaces, but not flying out over the river.

"I have also a spread specimen from Southern Pines, making three localities (Southern Pines, White Lake and Lumberton), all in southeastern North Carolina, from which we have had this species."

With great pleasure I dedicate this new *Gomphus* to Mr. C. S. Brimley, the collector, whose painstaking collections have furnished the basis for frequent Odonatological notes by various authors.

This is the smallest *Gomphus* known.* It is closely related to *G. cavillaris* Needham, but undoubtedly distinct. Besides its smaller size, it can be readily recognized by the well defined line of yellow on a black background on the abdomen—vague and on a brown background in *cavillaris*. The appendages of the ♂ are narrower and the prolongation more attenuated than in *cavillaris*. The ♀ vulvars are rounded, the emargination not angled; angulate, and the emargination angled in *cavillaris*, as can be readily seen from the figures. (The vulvars of *G. cavillaris* are somewhat overdrawn, as their true proportion to the length of the segment is 1:10).

THE CURCULIONIDS of the *Biologia Centrali-Americana*, worked out by Mr. G. C. Champion, have been presented by Dr. F. D. Godman to the British Museum of Natural History; they number 2,617 species and about 10,000 specimens. Mr. Champion is now working at the remainder of the Curculionids (Otiiorhynchids) commenced by Dr. David Sharp, and hopes to get through them this summer. This will finish the whole of the Coleoptera of the *Biologia*.

[*The dimensions given for *Gomphus naevius* Hagén, from Maine, by the late Professor F. L. Harvey, are smaller than those here stated for *G. brimleyi*. See Ent. News, IX, p. 63, 1898.—P. P. C.]

Endaphis hirta n. sp. (Dipt.).

By E. P. FELT, Albany, N. Y.

The species described below was reared by Mr. E. E. Green in June, 1894, from a *Dactylopius* on *Mimusops hexandra*, Tangalla, Ceylon, and transmitted to Dr. L. O. Howard, through whose courtesy we are permitted to describe it, under date of December 3, 1895. The form is so unique that we feel justified in describing it though the specimen is in poor condition.

Male.—Length 1.5 mm. Antennæ as long as the body, thickly haired, light fuscous yellowish, yellowish basally; 14 segments, the first broadly obconic, somewhat excavated and with a slight tooth dorsally, the second short, subhemispheric, the third slightly fused with the fourth, the fifth binodose, the basal portion of the stem with a length a little greater than its diameter, the distal part with a length twice its diameter; basal enlargement a very oblate spheroid; the subbasal whorl very thick, the setæ long, stout and almost approximate basally; the circumfili stout, the loops numerous and extending nearly to the base of the practically identical distal enlargement; terminal segment having the basal enlargement subglobose, the basal portion of the stem with a length nearly twice its diameter, the distal enlargement slightly produced, with a length about $\frac{3}{4}$ its diameter and with a short, stout apical appendage. Palpi yellowish, the first segment subrectangular, the second narrowly oval, the third a little longer and more slender, the fourth as long as the third, somewhat dilated. Mesonotum fuscous yellowish. Scutellum and postscutellum yellowish. Abdomen fuscous yellowish. Wings thickly clothed with long, scale-like hairs. Costa yellowish brown, subcosta uniting therewith near the basal third, the third vein well before the apex. Halteres yellowish transparent, fuscous apically. Coxæ yellowish, femora fuscous yellowish, tibiæ and tarsi mostly fuscous. Claws very strongly curved, probably simple, the pulvilli not visible in the preparation. Genitalia wanting.

Type in the United States National Museum.

This species is easily differentiated from all other forms known to the writer by the extremely thick sub-basal whorl of long, stout setæ on the enlargements of the flagellate segments. These setæ are so numerous as to be almost approximate basally and arranged in a practically straight row.

DR. SAMUEL H. SCUDDER has been elected a foreign member of the Zoological Society of London.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, four weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.—Ed.

PHILADELPHIA, PA., MAY, 1911.

DESTROYING THE GYPSY MOTH.

Dr. W. E. Britton, State Entomologist of Connecticut, in his report for the year 1910, gives a most interesting account of his efforts to rid the State of the Gypsy Moth, discovered at Wallingford in December, 1909. It is to be hoped that he has eradicated this terrible pest in the locality mentioned. The work was thoroughly done and nothing omitted that knowledge and experience of the subject made possible.

"While working in a tree, one of the men, Mr. R. W. Bolton, observed a Gypsy caterpillar crawling along a telephone cable which passed between the branches of the tree. This method of spreading may account for the caterpillars appearing in certain trees where all egg-masses had been destroyed and a tanglefoot band placed around the trunk. Telephone wires passed directly from infested trees into these described." One egg-mass was said to contain 1,485 eggs.

A summary of the work may prove interesting. Egg-masses destroyed, 8234; trees banded with burlap, 10,000; trees banded with tanglefoot, 365; trees pruned, 904; cavities filled with cement, 27; cavities covered with tin patches, 1959; caterpillars destroyed at burlap bands, 8936; cocoons destroyed, 95; number of trees found infested, 248; amount of lead arsenate used, pounds, 768; tanglefoot used, pounds, 120; burlap used, yards, 2493; number of men employed, maximum, 18; cost of the work at Wallingford, \$3823.24.

If these insects had been left to their own devices the next generation of moths would have produced over two hundred millions of caterpillars.—H. S.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS
OF THE GLOBE.

CICINDELA UNICOLOR Dej.—Mr. Edw. D. Harris writes from Camden, South Carolina, under date of March 19, "I am taking very fine specimens of this species here."

A SPECIAL COMMISSION, to be despatched by the British South Africa Company to investigate sleeping sickness in Rhodesia, will include Mr. O. Silverlock as entomologist.—SCIENCE.

THE article entitled "A Day with *Euchloe cethura*," published in the News for January, 1911, page 11, should be credited to Messrs. Karl R. Coolidge and Victor L. Clemence as joint authors, and not to Mr. Coolidge alone.

DR. W. J. HOLLAND, director of the Carnegie Institute, Pittsburgh, author of the *Butterfly Book*, the *Moth Book* and numerous other works on Lepidoptera, has received from the Czar of Russia, the insignia of a knight of the order of St. Stanislas, second class, in recognition of his services to science.

DOG AND CAT FLEAS NOT IDENTICAL.—At the meeting of the Entomological Society of London, on Nov. 16, 1910, the Hon. N. C. Rothschild exhibited examples of two species of fleas, *Ctenocephalus canis* (dog flea) and *C. felis* (cat flea), and stated that, although still frequently considered to be identical, they were really quite distinct species. Under the microscope it was seen that whereas the head of the dog flea was rounded, that of the cat flea was long and flat. The two had been united by Dr. Taschenberg under the name of *serraticeps*, a name which most certainly could not be retained.

TIMERES.—Since the publication of the note on *Timetes pelcus*, on page 111, of the News for March, 1911, I have received additional information from Mrs. Annie Trumbull Slosson and Mr. Philip Laurent. Mrs. Slosson writes as follows: "Your note on *Timetes* interests me. I have recognized but one species in Florida and that you identified for me as *eleucha* years ago. I am sending you three specimens. Their habit of flight is so peculiar that they are difficult to capture. They fly very high in the tops of the highest trees, rarely coming lower and their thin, delicate, fragile tails break so easily that it is hard to secure perfect specimens."

I was in error in calling the specimen *eleucha* that Mrs. Slosson sent me from Biscayne Bay, Florida. Mr. Laurent says he found the species very common south of Miami, Florida. The specimens he has sent me were taken on various days during the month of March. Mr. Laurent says that all he took were more or less damaged. All of these specimens were *pelcus* Sulz. (*petreus* Cramer).—HENRY SKINNER.

PLATYPSYLLA CASTORIS RITS. IN CALIFORNIA.—Prof. Joseph Grinnell, of the Museum of Vertebrate Zoology in Berkeley, has been kind enough to send me a bottle with 46 specimens of this curious beetle. The bottle had the following label: "Taken from fur around nose and face of Beaver (*Castor canadensis*) from Graycom, Stanislaus Co., Calif. (on San Joaquin R.) March 25, 1911."

DR. A. FENYES, of Pasadena, California, recently elected a Fellow of the Entomological Society of London, has presented four boxes containing an admirable collection of North American Aleocharinae (Coleoptera) to the Society which, in the absence of any collections belonging exclusively to the Society, have been transferred to the British Museum of Natural History.—ENTOMOLOGIST (London), January, 1911.

I shall be pleased to exchange specimens of this interesting species for beetles of the Staphylinid subfamily Aleocharinae, in which latter group I am especially interested.—ADALBERT FENYES, M.D., Pasadena, California.

MIASTOR LARVAE.—These remarkably interesting larvae, reproduced by pedogenesis, are available for laboratory work to a marked degree and must be widely distributed as well as allied forms. Very little is known concerning American species, largely because their habitat is one rarely explored by entomologists. They breed mostly in decaying vegetable matter. We have been very successful in finding them under partially decayed chestnut bark of stumps, fence rails and sleepers which have been cut one or two years earlier. European species have been observed under the bark of a variety of trees and even in sugar beet residue. These Dipterous maggots with diverging antennae have a flattened, triangular head quite different from the strongly convex, usually fuscous head of the *Sciara* larvae occurring in a similar environment. They have a length of from 1-20 to $\frac{1}{4}$ of an inch and may be found in colonies containing a few large, white larvae with numerous smaller, yellowish individuals, though the latter appear more common at the present time. Early spring with its abundance of moist bark appears to be the most favorable season for finding the larvae. The writer would welcome the co-operation of entomologists and others in searching for these forms in different parts of the country. He will be pleased to determine specimens found under various conditions, make rearings therefrom if possible, and thus add to our knowledge of the sub-family Heteropezinae, a group which should be fairly abundant in North America and one deserving careful study.—E. P. FELT, State Entomologist's Office, Albany, N. Y.

[Dr. Felt has published a more extended note on *Miastor* larvae in *Science* for Feb. 24, 1911, page 302.—ED.]

A NEW HEMILEUCA.—At the November 21st, 1910, meeting of the Manchester (England) Entomological Society, as reported in the *Entomologist* (London) for January, 1911, Mr. J. H. Watson exhibited "a new moth belonging to an aberrant group of the Saturniidae (*Hemileuca* sp.) allied to *H. neuwoegeni* (H. Edwards), the specimens bred from pupæ collected in the neighborhood of the Truckee Pass, on the California-Nevada divide of the Rocky Mountains."

FLIES AND DISEASE.—At the December, 1910, meeting of the newly organized Helminthological Society of Washington, Dr. C. W. Stiles discussed the subject of rural sanitation with special reference to the disposal of fæces. In comparing the relative merits of the dry and wet systems of disposal, he said: "Flies feed and breed in the dry system. In one place about 80 privies were examined. Although lime was furnished free, it was only used generously in three cases, and flies were breeding in these places as in the others. The fæces are collected in wagons and buried; burial under a foot of soil being recommended. The carts carry and distribute flies. Experiments showed that flies developed and crawled up to the surface from fly-blown fæces buried under six and a half inches of sand; they came through 17 inches in 24 hours; and flies issued after burial under 48 inches of sand. Flies were obtained even after burial under six feet of sand. In the last two cases, the sand used was not sterilized but was pure sand carefully selected. These are final arguments against the dry system. The system favors the sporulation of amœbæ. Flies can bring to the surface and distribute amœbæ spores or typhoid bacilli. Under some circumstances privies may be more important than the manure piles as breeding places for flies."—*SCIENCE*, Feb. 3, 1911.

EXHIBITION OF MODELS OF MEMBRACIDÆ.—At the meeting of the New York Academy of Science, Section of Biology, Dec. 12, 1910, Mr. Ignaz Matusch exhibited a series of six enlarged models in wax which he had prepared for the American Museum of Natural History, as well as a series of twenty-three colored drawings and a collection of typical specimens which had been sent him by Professor F. Silvestri, of Portici, Italy. The Membracidæ, or tree-hoppers, are among the most interesting of insects. Very little is yet known concerning their life histories, a subject to which the speaker said he had devoted considerable attention. They are remarkable for their extraordinary variation in the form of the prothorax. In order to make an enlarged model it is necessary to dismember the insect and to prepare drawings of the different parts to a selected scale. The separate parts are then copied in clay; plaster molds are then prepared and casts made in wax. These are then finished, the details put in, and the whole put together and colored.—*Science*.

POSSIBLE CAUSES OF LOCAL DISTRIBUTION OF ODONATA.—[The following suggestion occurs in a recent letter.] I want to get more observations on our old gravel pits especially. They offer a great opportunity, but my time has always been too limited to avail myself of it. I believe, however, that these old pits have a richer dragonfly fauna a few years after they are abandoned, than they have in later years. The dragonflies reach the ponds first—their enemies or checks of some sort come later. This may go a long way to explain the uniformity of odonate life in old marshes—such as coastal brackish marshes—a few widely distributed species—a dead level of adaptation—no ebb or flow of new odonate life across it. In the newly made pools (ox bow bends, bayous, pools at foot of cliffs along rivers, pools in parks, gravel pits, etc.) occur the rarer (*i. e.*, more isolated, scattered) species to last a greater or lesser number of years and give way to a few common, widely distributed species. I don't mean that the common widely distributed species necessarily drive away the others—possibly in later years fish get established in the ponds, and the first dragonfly occupants are checked or exterminated by fish, which do not prey on later arrivals.—E. B. WILLIAMSON, Bluffton, Indiana.

THE LIFE HISTORY OF ATTEVA AUREA FITCH.—It was at the later part of August when I was out collecting, that my attention was called to a web which looked to me like a spider's nest, on a small aianthus bush. By investigating more closely, I saw a chrysalis suspended in the web. Not knowing what it was, I took it home, and several days after, a small moth emerged and proved to be *Atteva aurea*. As I knew the food plant now, I looked in the same neighborhood and found several similar webs containing newly hatched, as well as full grown, larvae and also chrysalids in them. The full grown larva is about $1\frac{1}{4}$ inches long, blackish, with a distinct brown stripe all along its back, while the sides are dotted with fine white spots. When disturbed the larva moves quite actively in the web. Looking for eggs, I found some attached to the web, distributed half an inch apart from each other, and this method of laying the eggs very likely accounts for the finding of newly-hatched caterpillars, as well as full grown larvae in the same web. The larva turns into a chrysalis in the same web. Previously to finding these, I occasionally took the moths in July, sitting on the flowers of the button ball bush, iron weed, etc., but never later. But this proves that the moths must be double brooded around Philadelphia, as all the moths hatched in September and October. As far as I could find out, there is no record as to food plant or life history of this little moth, but should any other collectors have made any observations in this respect, I would like to hear from them.—CARL ILC, 2728 Somerset St., Philadelphia.

DINNER IN HONOR OF MR. D. K. McMILLAN.—The departure from Brownsville, Texas, of Mr. D. K. McMillan, Bureau of Entomology, was the occasion of a farewell dinner given in his honor by other entomologists stationed there. Matamoros, Mexico, just across the river from Brownsville, was the scene of the entertainment, which was held on the night of March 8, 1911. The dinner was given in the French restaurant, and was followed by a theatre and "Boliche" party. Mr. McMillan was engaged in truck crop insect investigations in the Brownsville country. He will go North to take a position in Illinois under Dr. Forbes, and will investigate insects injurious to vegetables in the vicinity of Chicago. Besides the guest of honor, the following were present: Mr. R. A. Vickery, of the Cereal and Forage Crop Insect Investigations, Bureau of Entomology; Mr. M. M. High, of the Truck Crop and Stored Product Insect Investigations, Bureau of Entomology, and Mr. T. E. Holloway, at present on furlough from the Bureau and engaged in parasite investigations for the Deli Experiment Station, of Sumatra.

THE MERSHON EXPEDITION TO THE CHARITY ISLANDS, LAKE HURON.—For several years the University of Michigan Museum and the Michigan Geological and Biological Survey have been co-operating in a biological survey of the State. The survey has had a small annual appropriation for this work, and has deposited the collections in the museum, but the expeditions sent out from the latter have nearly all been made possible by gifts from persons interested in the progress of the work or in the institution.

In the summer of 1910, Hon. W. B. Mershon, Saginaw, Mich., placed in the hands of the chief field naturalist of the survey, who is also the head curator of the museum, a sum sufficient to send a small party to the Charity Islands in Saginaw Bay, for the purpose of investigating the fauna and flora.

The men engaged to do the work and the groups to which they devoted most of their time were as follows: W. W. Newcomb (butterflies and moths), N. A. Wood (vertebrates), A. W. Andrews (beetles), Frederick Gaige (ants), C. K. Dodge (plants). The museum and survey are greatly indebted to these men, for they did the field work without other remuneration than their expenses, and are now preparing their results for publication.

The results of the expedition will be published in various journals and in the annual reports of the Michigan Academy of Science under the common title "Results of the Mershon Expedition to the Charity Islands, Lake Huron." As most of the field work was done in the late summer and fall, the survey plans to continue the work in the spring and early summer of 1911.—ALEXANDER G. RUTHVEN, University of Michigan Museum (in *Science*).

COLIAS NASTES STRECKERI Gr. Grum-Grshimailo.—Mr. Henry H. Lyman has sent me the following: "I see in your supplement* a reference to a species *streckeri* described by Grote. Has his description ever been published in any American journal? If not, I wish you would get the editor of the ENTOMOLOGICAL NEWS to re-publish this description in English, if the original description was in any other language, as I know nothing of this form." Gr. is the abbreviation used for Gr. Grum-Grshimailo and Mr. Lyman can't be blamed for taking it to stand for Grote. The International Entomological Congress, I believe, has a project on foot to adopt a uniform plan for authors' names.

We have three specimens of *Colias nastes* in our collection, taken in the vicinity of Laggan, Alberta, by Mr. Thomas E. Bean. Mr. Bean also supplied Strecker with the material that found its way to Europe. I have compared our Canadian *nastes* with specimens from Europe and do not find any difference. In my opinion they do not deserve even a varietal name.—HENRY SKINNER, M.D.

[The original description by Gr. Grum-Grshimailo was published in Horae Societatis Entomologicae Rossicae 29,290, 1895, and is as follows:

"Colias Nastes var. Streckeri.

Forma ad. *Col. cocandicam* transitum efficiens.

Alae ♂ ♀ virescenti-sulphureae; anticarum limbo externo latiore, disco in nervis rarius nigrescenti-consperso; posticarum macula discocellulari supra lurida, subtus permagna ad marginem externum ut in *Col. eogene* et *cocandica* bidentata rufa.

Specimen unum hujus varietatis sub nomine '*Colias behrii*?' a lepidopterologo germanico D-re O. Staudinger anno 1891, quattuor specimina, in provincia Alberta ad Laggan collecta, a lepidopterologo americano Dom. H. Strecker, cujus in honorem hanc formam nominavi, accepi."

This may be rendered into English as follows:

Colias nastes var. streckeri. A form transitional to *C. cocandica*. Wings ♂ ♀ greenish-sulphur; external margin of the primaries wider, veins in the disc more thinly sprinkled with blackish; discocellular spot of the secondaries lurid above, below very large at the external margin bidentate reddish as in *C. eogene* and *cocandica*.

I received one specimen of this variety under the name "*Colias behrii*?" from the German lepidopterologist, Dr. O. Staudinger in 1891, and four specimens, collected at Laggan in the province of Alberta, from the American lepidopterologist, Mr. H. Strecker, in whose honor I have named this form.]

* A Synonymic Catl. North Am. Rhop. Suppl. No. 1. Publ. by American Entomological Society.

NEW YORK STATE ENTOMOLOGIST'S OFFICE NOT DAMAGED.—[We are very glad to publish the following reply from Dr. Felt to our inquiry concerning the fire in Albany.—Ed.]

April 3, 1911.

Thank you very much indeed for your query in regard to the recent fire in the State Capitol.

The office of the State Entomologist is in Geological Hall and therefore was not directly affected by the recent disastrous fire in the State Capitol. Unfortunately, we depend largely upon the reference works in the [State] library [in the Capitol] and it is probable that our bibliographic work will be seriously hampered for some months to come. It is gratifying to state that the office library, exceptionally efficient along economic lines in particular, escaped intact.—E. P. FELT, State Entomologist.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), excluding Arachnida and Myriapoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted. This (*) following a record, denotes that the paper in question contains description of a new North American form.

For record of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

4—The Canadian Entomologist. 5—Psyche, Cambridge, Mass. 6—Journal, New York Entomological Society. 7—U. S. Department of Agriculture, Bureau of Entomology. 8—The Entomologist's Monthly Magazine, London. 9—The Entomologist, London. 10—Nature, London. 11—Annals and Magazine of Natural History, London. 14—Proceedings, Zoological Society of London. 22—Zoologischer Anzeiger, Leipzig. 35—Annales, Societe Entomologique de Belgique. 38—Wiener Entomologische Zeitung. 40—Societas Entomologica, Zurich. 50—Proceedings, U. S. National Museum. 62—Handlingar, Konglige Svenska Vetenskaps-Akademiens, Stockholm. 64—Annalen, K. k. Naturhistorischen Hofmuseums, Wien. 69—Bolletino, Societa Italiana Entomologica. 81—Biologisches Centralblatt, Erlangen. 90—Revue Scientifique, Paris. 97—Zeitschrift fur wissenschaftliche Zoologie, Leipzig. 123—Bulletin, Wisconsin Natural History Society, Milwaukee. 143—Ohio Nat-

uralist. 148—New York Agricultural Experiment Station, Geneva. 163—American Journal of Science, New Haven, Conn. 172—The American Museum Journal, New York. 180—Annals, Entomological Society of America. 182—Revue Russe d'Entomologie, St. Petersburg. 184—Journal of Experimental Zoology, Philadelphia. 186—Journal of Economic Biology, London. 193—Entomologische Blätter, Nürnberg. 196—Arkiv för Zoologie, Stockholm. 198—Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass. 200—Bulletin Scientifique de la France et de la Belgique, Paris. 216—Entomologische Zeitschrift, Stuttgart. 227—Memorias, Instituto Oswaldo Cruz, Rio de Janeiro. 240—Maine Agricultural Experiment Station, Orono. 248—Hawaii Agricultural Experiment Station, Honolulu. 259—Publications, Carnegie Institution of Washington. 279—Jenaische Zeitschrift für Naturwissenschaft, Jena. 284—Bulletin, Muséum National d'Histoire Naturelle, Réunion Mensuelle des Naturalistes du Muséum, Paris. 317—Mitteilungen der Naturwissenschaftlichen Gesellschaft in Winterthur. 318—Proceedings of the Davenport Academy of Sciences. 319—Annual Report and Transactions of the Manchester Entomological Society, Manchester (England). 320—Der Tropenpflanzer, Berlin. 321—Annals of the New York Academy of Sciences. 322—Journal of Morphology, Philadelphia. 323—Annales de l'Université de Lyon. Nouvelle série. I. Sciences, Médecine. 324—Journal of Animal Behavior, Cambridge, Mass. 325—Skandinavisches Archiv für Physiologie, Leipzig.

GENERAL SUBJECT. Anon.—Insect and fungoid pests (review of work done, etc.), 10, lxxxvi, 161-162. Fullaway, D. T.—Insects attacking the sweet potato in Hawaii, 248, Bull. No. 22, 9-31. Hartzell, F. Z.—A preliminary report on grape insects, 148, Bul. No. 331, 485-581. Kirchner, O. von.—Blumen und Insekten. Ihre Anpassungen aneinander und ihre gegenseitige Abhängigkeit. 436 pp. Leipzig und Berlin. B. G. Teubner, 1911. Pearse, A. S.—The influence of different color environments on the behavior of certain arthropods, 324, i, 79-110. Picado, C.—Documents sur le mimétisme recueillis en Costa-Rica, 200, xlv, 89-108. Preuss, P.—Ueber Schädlinge der Kokospalme, 320, xv, 59-91. Rosa, D.—L'opera zoologica di E. H. Giglioli, 69, xli, 19-27. Washburn, F. L.—13th Report of the state entomologist of Minnesota to the governor for the years 1909-1910. 184 pp.

APTERA AND NEUROPTERA. Alderson, E. M.—Notes on *Chrysopa dorsalis*, 8, xxii, 49-54. Atmore, E. A.—Further Notes on *Chrysopa dorsalis*, 8, xxii, 54-56. Escherich, K.—Termitenleben auf Ceylon. Neue Studien zur Soziologie der Tiere, zugleich ein Kapitel kolonialer Forstentomologie. Jena. Gustav Fischer, 1911.

262 pp. **Handlirsch, A.**—New paleozoic insects from the vicinity of Mazon Creek, Illinois (cont.), **163**, xxxi, 297-326 (*). **Jones & Horton.**—The orange thrips (*Euthrips citri*): A report of the progress for the years 1909 and 1910, **7**, Bull. No. 99, pt. i, 16 pp. **Muttkowski, R. A.**—Miscellaneous notes and records of dragon flies, **123**, viii, 170-179 (*). **Rimsky-Korsakow, M.**—Ueber die systematische Stellung der Protura, **22**, xxxvii, 164-168. **Schmutz, K.**—Zur Kenntnis einiger neuen Thysanopterengenera (*Tubilifera*), **64**, xxiii, 273-281, 342-347. **Wolley Dod, F. H.**—Habits of *Smerinthus geminatus* and *cerisyi*, **4**, xliii, 104. **Zawarzin, A.**—Histologische Studien ueber Insekten. I. Das Herz der Aeschnalarven, **97**, xcvi, 481-510.

ORTHOPTERA. **Borelli, A.**—Mission geodesique de l'equateur. Forficulides, **284**, 1910, 156-158. **Jensen, J. P.**—The structure and systematic importance of the spermatophores of crickets, **180**, iv, 63-66. **Pocock, R. I.**—Remarks upon, and exhibition of two drawings illustrating an instance of ant-mimicry by the larvae of a species of Mantis; with a note on the mimicry of the larva of the Ceylonese Leaf-insect (*Phyllium* sp.?), **14**, 1910, 837-840. **Zacher, F.**—Studien ueber das System der Protodermapteren, **22**, xxx, 303-400.

HEMIPTERA. **Barber, H. G.**—Descriptions of some new Hemiptera-Heteroptera, **6**, xix, 23-31 (*). **Bedau, K.**—Das Facettenauge der Wasserwanzen, **97**, xcvi, 417-456. **Bergroth, E.**—New Neotropical Plocariinae, **5**, xviii, 15-20. **Distant, W. L.**—Rhynchotal notes, LIII: Neotropical Pentatomidae, **11**, vii, 242-258. **Fullaway, D. T.**—Description of a new Coccid species, *Ceroputo ambigua*, with notes on its life-history and anatomy, **318**, xii, 223-240 (*). **Gadd, G.**—Contributions a l'anatomie comparee des cigales et de *Tettigonia viridis* (Russian), **182**, x, 205-213. **Hodgkiss, H. E.**—The apple and pear membracids, **148**, Tech. Bul., No. 17, 81-112. **Muir & Kershaw.**—On the homologies and mechanism of the mouth-parts of Hemiptera, **5**, xviii, 1-12. **Neiva, A.**—Beitraege zur Biologie des *Conorhinus megistus*, **227**, ii, 207-212. **Wilson, H. F.**—Notes on the synonymy of the genera included in the tribe Lachnini, **180**, iv, 51-54.

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Doings of Societies.

ENTOMOLOGICAL SECTION, ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA.

Meeting of January 26, 1911; Mr. Philip Laurent, Director, presided; eleven persons present.

Mr. Rehn made a few remarks on a study of the Orthoptera of the Great Lake region of Central Africa in which he is now engaged. By the aid of an outline map he indicated the eastern limit of the great Congo Forest, the fauna of which is strongly represented in the Great Lake region. Specimens of *Polyspilota validissima*, a Mantid which the speaker found ranged almost across the Congo State, individuals of *Amorphoscelis*, an aberrant Mantid not previously examined by the speaker, and the type of the first African species of *Humbertiella*, a genus previously known only from the East Indies, were exhibited.

Mr. H. W. Wenzel reported the capture of *Aptenodes sphenarioides* in Philadelphia on January the 18th. He also spoke of the good work shown in some recent papers in which the species were well studied, particularly the life histories, as by Prof. Hopkins, in *Dendroctonus*. He also spoke of the value of a recent paper on *Pissodes*.

Dr. Skinner spoke in appreciation of the work being done by the African Entomological Research Committee and of the Bulletin they are publishing. He also exhibited specimens of *Argynnis sakuntala*, a species he had recently described, and compared it with *rhodope* and allied forms.

Meeting of March 23, 1911. Mr. Philip Laurent, Director, presiding; fifteen persons present; Mr. Nathan Banks, of Washington, D. C., visitor.

Mr. Banks said he came to Philadelphia to study some Hymenoptera in the Cresson collection. He was pleased to meet the members and would like to have a collecting trip with them in this locality and would also gladly exchange specimens.

Mr. Rehn exhibited specimens illustrating the variability in structural and color characters found by him in the Acridiid *Eritettix simplex*. One hundred and forty-eight specimens from Sulphur Springs, North Carolina, were the basis of his work. The supplementary carinae of the pronotum were found strongly or faintly indicated or lacking, while two marked, dominant, color phases were found, connected by a number of intermediates. The same speaker also exhibited the type of a remarkable new genus and species of African Mantidae.

Dr. Skinner exhibited a large series of *Lycacna enoptes*, *battoides* and *glaucon*. He considered them variants of one species.

Dr. Calvert gave a very interesting description of the country on the Pacific side of Costa Rica. There are no railroads in the province of Guanacaste, and in the wet season it is practically untraversable. While sleeping in a school house at Santa Cruz, he had been bitten by an insect and in the mornings found two specimens of a *Conorhinus* (which were exhibited), and attributed the bites to them.

Mr. Banks referred to the severe disease carried to man from monkeys by these insects in Brazil.

Mr. Laurent stated that some lepidopterists were under the impression that *Danaus plexippus* was three-brooded in the State of New Jersey, which the speaker said was a mistake, and that he was sure that no species of Rhopalocera or butterfly, found in New Jersey, unless it was *Pieris rapae* or *Lycacna pseudargiolus*, was more than two-brooded, and that a number of species were represented by only one brood in a season, as for instance *Pamphila metea*, *pontiac*, *leonardus*, etc. The

speaker then went into details concerning the migrating habit of *Danais plexippus*.

Mr. Harbeck referred to the fact that insects are not infrequently cited and recorded in error. As an instance of this he mentioned *Carabus nemorellus* reported from Maplewood in the "New Jersey list."

Mr. Banks cited the Coddling Moth as illustrating the liability of error in stating the number of broods of an insect from dates of capture without actual breeding experiments from known females. The question of variation was generally discussed.—HENRY SKINNER, *Recorder*.

OBITUARY

DR. EDWARD PALMER.

The daily newspapers announce the death of this veteran botanical explorer and collector at his home, 207 Twelfth Street, Southwest, Washington, D. C., on April 10, 1911. He was born in England, January 12, 1821, came to America at the age of eighteen and settled first at Cleveland, Ohio. An interesting sketch of his life by W. E. Safford, read in celebration of his eightieth birthday, was published in the *Popular Science Monthly* for April, 1911. Although Dr. Palmer was primarily engaged in botanical researches, he made collections of animals also, including insects, some of his specimens of these last being in the Museum in Cambridge and Washington (see page 198 of this NEWS). His most noteworthy expeditions were to various parts of the southwestern United States and to Mexico. His zeal was maintained throughout his long life, as in 1910 he collected near Tampico, Tamaulipas, Mexico.

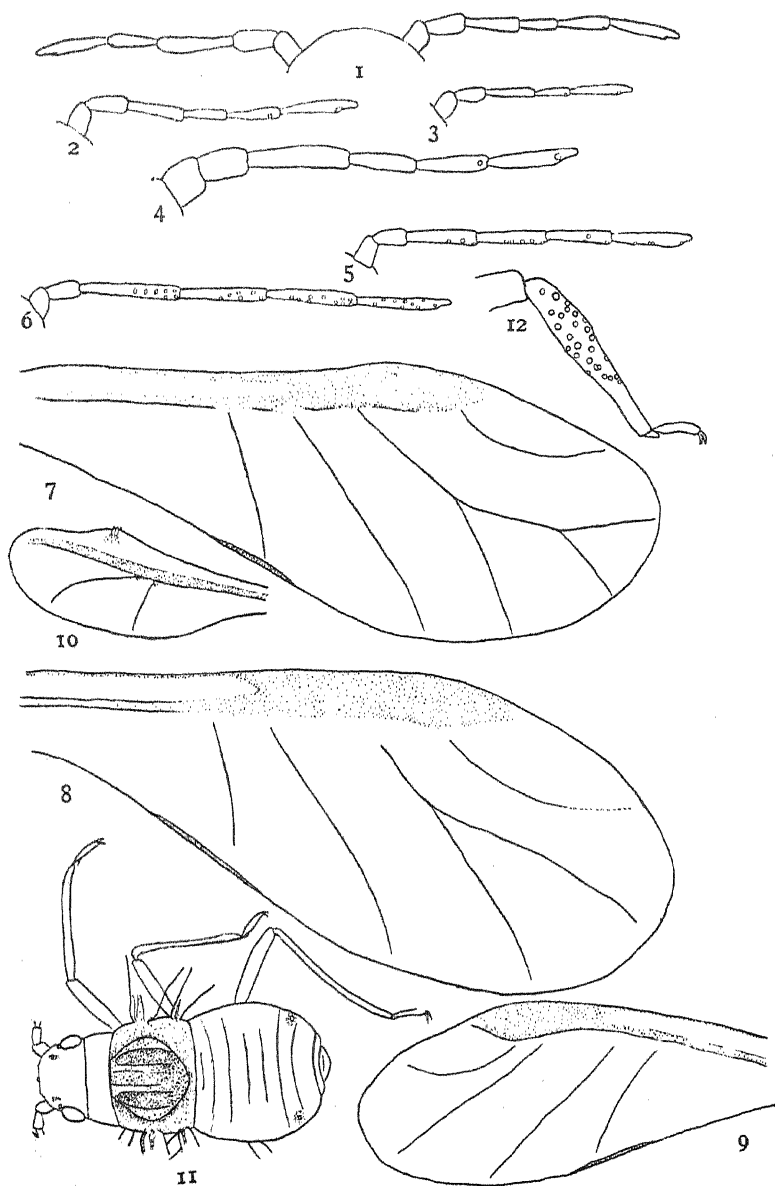
PROF. FELIX PLATEAU.

A recent number of the *Zoologischer Anzeiger* informs us of the death of this distinguished physiologist and entomologist on March 4, 1911, in Ghent, where he had long been a Pro-

fessor in the University. He was born June 16, 1841. His researches were largely directed to the little cultivated and technically difficult field of the functions of Arthropod organs and of the relations of these animals to the surrounding media. Some of his principal memoirs are *Sur la force musculaire des insects* (1865, 1866), *Recherches sur les Crustacés d'eau douce de Belgique* (1870), *Recherches physico-chimiques sur les Articulés aquatiques* (1871), *Qu'est-ce que l'aile d'un Insecte?* (1871), *Recherches expérimentales sur la position du centre de gravité chez les insectes* (1872), *Recherches physico-chimiques sur les articulés aquatiques. II. Resistance à l'asphyxie par submersion, action du froid, action de chaleur* (1872); *Recherches sur les phénomènes de la digestion chez les Insectes* (1874-77), *chez les Myriapodes* (1876), *chez les Phalangides* (1876), *chez les Araneides dipncumones* (1877); *Sur les mouvements et l'innervation de l'organe central de la circulation chez les animaux articulés* (1879); *Influence de l'eau de mer sur les animaux d'eau douce et de l'eau douce sur les animaux marins* (1883), *Recherches expérimentales sur les mouvements respiratoires des Insectes* (1884), *Expériences sur le rôle des palpes chez les Arthropodes maxillés* (1885), *Recherches expérimentales sur la vision chez les Arthropodes* (1885-1889), *Les Myriapodes marins et la résistance des Arthropodes à respiration aérienne à la submersion* (1890); articles on the Arachnids (1895) and Crustacea (1900) in Richet's *Dictionnaire de Physiologie*; *Les fleurs, comment attirent-ils les insects?* (1904).^{*} Most of these appeared in the publications of the Royal Academy of Belgium.

At its annual meeting in December, 1910, the Entomological Society of Belgium elected Prof. Plateau Honorary President. This title had been conferred previously on but two persons, Constantin Wesmael and Edmond de Selys Longchamps.

^{*} For this partial list of Prof. Plateau's writings we have drawn chiefly from the bibliographies in Folsom's *Entomology* and v. Fürth's *Vergleichende chemische Physiologie der niederen Tiere* (1903). The latter contains summaries of some of these papers.



WOOLLY APHIS OF OAK--DAVIS.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

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The Woolly Aphis of Oak (Phyllaphis? querci Fitch) (Hemip.).

BY JOHN J. DAVIS. *

(Plate VII)

A woolly aphis, which is possibly the species described by Fitch as *Eriosoma querci*, has been collected by us on oak foliage from various localities in Illinois, definite collections having been made at Chicago, Joliet, Aurora, Rockford, Peoria and Danville. I have also received this species from Mr. W. P. Flint, who collected it on oak at Normal, Illinois.

Doctor Fitch described this species in his Fifth Report † as follows:—

“Oak Blight, *Eriosoma querci*, new species.

“A species of blight, or a woolly aphid upon oak limbs, puncturing them and exhausting them of their sap, was met with in northern Illinois, but I have never seen it in New York. It is very like a similar insect upon the basswood. The winged individuals are black throughout, and slightly dusted over with an ash-gray powder resembling mold. The fore wings are clear and glassy, with the stigma-

*Formerly of the office of the State Entomologist, Urbana, Illinois; now at the Experiment Station Building, Lafayette, Indiana.

†Fifth Report of the State Entomologist of New York. Ann. Rep. N. Y. State Agr. Soc. f. 1858 (1859), p. 804.

spot dusky and feebly transparent, their rib-vein black, and their third oblique vein abortive nearly or quite to the fork. It is 0.16 long to the tip of its wings. I find no woolly aphid mentioned by European authors as infesting the oak, except the *Eriosoma quercus* of Sir Oswald Mosley (Gardener's Chronicle, i. 828), which, in the List of Homopterous Insects of the British Museum, p. 1083, is supposed to be the *Coccus lanatus* of Geoffroy, and would hence appear to be a very different insect from the one now described."

Walsh‡ next lists the species from the United States, and Thomas* some years later quotes, in part the description as given by Fitch, and placing it in the genus *Schizoneura*, in which genus it has been placed by all writers since. In his list of Minnesota Aphididae† Oestlund states that he found apterous forms of what he supposes to be this species in Minnesota, and the next year (1887) ‡ he again reports with some doubt, this species, quoting from the original description. Packard lists the species§ among the forest insects, quoting from Thomas. Cowen** questionably determines as this species, immature wingless forms collected in Colorado, "August 19, in woolly patches on young shoots of *Quercus undulata*," and briefly describes them. Clarke†† next lists the species from California, giving no descriptive notes other than color, which is said to be black. Davidson‡‡ reports it as abundant in California on live oak (*Quercus agrifolia*). In a letter dated No-

‡ On the Genera of Aphididae found in the United States. Proc. Ent. Soc. Phila., Vol. 1 (1862), p. 303.

*Eighth Report of the State Entomologist of Illinois. Trans. Dept. Agr. Ill., Vol. XVI (1880), p. 130.

†List of the Aphididae of Minnesota. Fourteenth Ann. Rep. Geol. and Nat. Hist. Surv. Minn., 1886, p. 55.

‡Synopsis of the Aphididae of Minnesota. Bull. Geol. and Nat. Hist. Surv. Minn., No. 4 (1887), p. 29.

§Insects injurious to forest and shade trees. Fifth Rept. U. S. Ent. Com. 1890, p. 212.

**A preliminary list of the Hemiptera of Colorado. Bull. Colo. Agr. Exper. Station, No. 31, Tech. Ser. No. 1 (1895), pp. 116-117.

††A list of California Aphididae. Can. Ent., Vol. XXXV (Sept., 1903), p. 248.

‡‡Further notes on the Aphididae collected in the vicinity of Stanford University. Journ. Econ. Ent., Vol. III (Aug., 1910), p. 374.

venember 15, 1910, Mr. Davidson writes: "I found *Schizoneura querci* Fitch in flocculent masses on the under side of the leaves and also on the twigs of live oaks (*Q. agrifolia* and *Q. wislensii*). I have taken a few winged specimens, and the venation is that of *Schizoneura*." The present writer listed§ this species from Illinois, upon Fitch's authority and refers to a *Phyllaphis* collected in Illinois on oak leaves which he considers probably distinct from *querci* of Fitch.

It is with considerable doubt that I place the species found in Illinois the past few years as identical with the species described by Fitch as *querci*. The species which we have found and describe later in this paper lives on the upper- and under-surfaces of the leaves in small colonies, which are completely covered with a rather dense flocculence. During the summer only wingless viviparous females were found, while winged males and oviparous females were collected in October. In one instance a wingless male was taken. The species is quite variable, but evidently does not belong to the genus *Schizoneura*. Neither does it fully agree with the genus *Phyllaphis*, although it is more nearly related to this than it is to *Schizoneura*. From the unusually loose description given by Fitch, it is impossible to positively recognize the species. The principal characters of *querci* as given by Fitch are its habitat and color, the former agreeing quite well with the species before us, but the color being quite different, our species being pale greenish in the viviparous to pale brownish in the oviparous forms. Ashmead* described a black aphid on oak which he called *Phyllaphis niger*, which agrees more nearly with the species characterized by Fitch as *querci*. Full descriptions are herewith given, hoping that they will be an aid to future investigations. As the writer has above indicated, he is of the opinion that Fitch's species is possibly different from the one here described, but that this one is the same as the species considered as *querci* Fitch by Oestlund, Cowen and Davidson.

§ A list of the Aphididae of Illinois, with notes on some of the species. Journ. Econ. Ent., Vol. III (Oct., 1910), p. 413.

*On the Aphididae of Florida, with descriptions of new species. Can. Ent., Vol. XIII (1881), p. 155.

Wingless viviparous female.—Head and thorax usually yellow or yellowish brown, the fore part of the head being pale dusky. Abdomen, after removal of the white flocculence, usually pale green, but sometimes pale yellow or yellowish green, and usually darkest on the sides. Eyes blackish. Beak not reaching, or barely reaching, the coxæ of second pair of legs. Antennæ very pale greenish or yellowish, excepting distal ends of IV and all of V and VI, which are dusky to blackish; rather short, being a third or less the length of the body; segments vary in length as will be noticed from the accompanying figures; usually 6-segmented, but often only 5; as a rule III and VI sub-equal, II and IV sub-equal, V longer than IV but shorter than VI; sensoria only at distal ends of V and VI. (Fig. 1 drawn from specimens collected in Chicago, October 22, 1908, show two antennæ from the same specimen, one being 5- and the other 6-segmented; figs. 2 and 3 were drawn from different individuals, but both from same colony collected in Chicago September 15, 1908; fig. 4 drawn from specimen collected by Mr. W. P. Flint at Normal, April 9, 1908). Legs pale greenish excepting distal half of tarsi, which are black. Abdomen with six longitudinal rows of wax glands, three on each side of the median line, one of these being on the lateral edge. Cornicles very slightly elevated above the surface, but quite distinct, being represented by dusky to blackish rings. Style sub-obsolete.

Wingless male.—A single specimen was collected at Chicago, September 15, 1908, and no color notes were taken. The size and general appearance of the body much resembles that of the winged male described below. Antennæ barely reaching to cornicles; the last four segments sub-equal, V being invariably shorter than II or IV, and VI invariably longer than III or IV; segment III with 3-4 circular sensoria in a row, IV with 3-5, V with 2-4 in addition to the usual one at distal end, and VI with 2-4 and the usual one at end of basal portion. (Pl. VII, fig. 5).

Winged male.—Head and thoracic shield dusky brownish to blackish, neck yellowish, abdomen pale greenish to yellowish. One specimen had indistinct irregular dusky markings. (Pl. VII, fig. 11). In colonies beneath a heavy flocculence, and individuals covered with a fine pulverulence. Beak reaching a little beyond coxæ of first pair of legs but not to coxæ of second pair. Eyes dark red to black. Antennæ dusky, paler at base; reaching about to cornicles; last four segments about sub-equal; III with 3-8 circular sensoria; IV with 4-7, V with 6-11, and VI with 5-10. (Pl. VII, fig. 6). Legs pale excepting joints and the tarsi, which are dusky. Wing veins blackish. Venation variable, as follows: Of the five specimens before me, two individuals have the discoidal of both wings twice branched (Pl. VII,

fig. 7); another specimen has one wing with discoidal twice branched and in the other wing it is only once branched (Pl. VII, fig. 8); one specimen has a once-branched discoidal in one wing and a partial second branching in the other wing; the last individual has both discoidals only once-branched. Summing up, there are five twice-branched discoidals, one with partial second branch, and four only once-branched. Mr. J. T. Monell very kindly loaned me a slide bearing two winged males of this species. Two of the wings have discoidal twice branched, another no branching (Pl. VII, fig. 9), and the fourth wing is missing. The specimens from Monell's collection were collected by Mr. Theo. Pergande on *Quercus alba* and *Q. prinus*, Washington, D. C., October 24, 1882. Cornicles very slightly elevated above surface abdomen, dusky, with blackish line indicating the opening. Described from five individuals collected at Chicago, October 22, 1908, and at Danville, Ill., October 8, 1910.

Measurements.—Average: Length of body, 1.01 mm.; width, 0.43 mm.; length of wings, 1.42 mm.; width, 0.54 mm.; antennae III, 0.20; IV, 0.20; V, 0.18; VI, 0.19; average total, including segments I and II 0.88 mm.

Wingless oviparous female.—Entire body covered with a rather heavy pulverulence, beneath which the body color is greenish to pale brownish, more often the latter, especially late in the season. Head dusky. Prothoracic segment with two dusky spots near the anterior and two near the posterior margin. Body with two longitudinal rows of dots close together on each side of the dorsal median line and a single row on each side at the margin. Eyes dark red. Beak not quite, or barely, reaching the coxæ of the second pair of legs. Antennæ dusky, more uniform than in the viviparous female, and are, as a rule, of a type shown in fig. 4. Legs short and dusky, hind tibiæ with many circular sensoria on the basal two-thirds. (Pl. VII, fig. 12), Cornicles indicated by dark circular rings. In size and other respects it has the appearance of the viviparous female.

EXPLANATION OF PLATE VII.

Phyllaphis (?) *querci* Fitch.—Figs. 1, 2, 3 and 4, antennæ of wingless viviparous female; 5, antenna of wingless male; 6, antenna of winged male; 7, 8 and 9, fore wing of winged male; 10, hind wing of winged male; 11, winged male; 12, hind tibia of wingless oviparous female.

Camera lucida drawings, figs. 1, 2, 3, 4, 5, 6, 7, 8 and 12, with a one-inch eyepiece and two-thirds objective; 9, 10 and 11, with a two-inch eyepiece and two-thirds objective. In other words, 9, 10 and 11 are drawn to three-fifths the size of the others.

A New Species of *Gerris* (Hemip.).

By the late G. W. KIRKALDY, F. E. S.*

Gerris buenoi n. sp.

Belongs to sub-genus *Gerris*. Middle tarsi moderately slender with the first segment three times as long as the second; hind tibiae and tarsi together scarcely as long as their femur.

Sternites in the male flattened, not carinate, the seventh doubly emarginate at the apical margin, the middle (2d) emargination broad and somewhat roundedly angular; not produced into a spine at the angles of the sternite; eighth sternite in the female transverse. Metasternal tubercle small, black; pronotum not suffused on the disc with reddish or yellowish but with the fore lobe with a marginal flavescent line. Length, males, macropterous form, 7 to $7\frac{1}{2}$ mm.; apterous form, 7 mm. Length, females, macropterous form, $7\frac{1}{2}$ to 8 mm.; apterous form, $7\frac{3}{4}$ mm.

[Note by J. R. T. B.—This species is a very near neighbor of *Gerris marginatus* Say, with which it has often been confounded in collections. Aside from the correlated structural characters, however, the flavescent margin of the anterior lobe of the pronotum serves to distinguish it at once. It can also be separated by its smaller size, pronounced sutures between the abdominal segments, and more or less flattened abdomen in the male.

My good friend, Mr. E. P. Van Duzee sent me specimens of this species labelled "*Gerris sulcatus* Uhler," but neither he, Kirkaldy, nor myself have succeeded in finding a description by this author anywhere, hence Kirkaldy concluded that it was merely a manuscript name and decided to describe it, naming it after me. The last I much deprecate, since my views are decidedly against the practice of giving to insects some form of the name borne by an individual.

The species is widely distributed and ranges from British Columbia to the Atlantic States.]

*This is one of several fragments left by my lamented friend. It is, as may be seen, a rough preliminary diagnosis, which I have gone over, but it is distinctly not to be regarded or considered as in any way my work, as my share in it has been that of a transcriber only.—J. R. T. B.

Notes on Paraguayan Orthoptera, with Descriptions of a new Genus and Four new Species.

By JAMES A. G. REHN, Academy of Natural Sciences,
Philadelphia, Pa.

The following notes and descriptions are based on a small but very interesting collection of Orthoptera submitted to me for study by the well-known naturalists, A. de Winkelried Bertoni and Prof. C. Schrottky, of Puerto Bertoni, Paraguay, from which locality the greater portion of the material was secured. Prof. Bruner has already reported* on a collection of Acridoidea from this locality.

FORFICULIDAE.

Pyragra brasiliensis (Gray).

Puerto Bertoni.—One female (Schrottky).

Pyragra paraguayensis Borelli.

Paraguay.—One male (Schrottky). This specimen is slightly smaller than the original measurements of the species, but otherwise it is typical.

Demogorgon batesi Kirby.

Puerto Bertoni.—One male (Schrottky).

BLATTIDAE.

Pseudomops sp.

Puerto Bertoni.—November. One broken specimen. (Bertoni, No. 715).

Ischnoptera bilunata Saussure.

Asuncion.—1900. Two males. This species was described from Chiquitos, Bolivia.

Nyctibora sericea Burmeister.

Puerto Bertoni.—October, 1904. (Bertoni, No. 413).

Panchlora thalassina Saussure and Zehntner.

Puerto Bertoni.—December, 1909. Two females. (Bertoni, No. 401).

*ENT NEWS, XXI, pp. 301-307.

Caudell has recorded this from Sapucay, Paraguay, while Giglio-Tos reported it from Tala and San Lorenzo, Argentina.

Tribonium spectrum (Eschscholtz).

Puerto Bertoni.—October, 1909. One female. (Bertoni, No. 402).

This species has been recorded from Brazil (numerous authors), and Caiza, Bolivian Chaco (Giglio-Tos), while a record of a larva of an undetermined species of this genus from Villa Rica, Paraguay (Giglio-Tos) may refer to this species.

Monastria biguttata (Thunberg).

Yaguarasapa.—1892. One male. (Bertoni, No. 479).

Blaberus minor Saussure.

Paraguay.—1904. One female. (Bertoni, No. 412). Giglio-Tos has recorded this species from San Lorenzo, Argentina and Aguairenda, Bolivian Chaco and numerous authors have credited it to Brazil.

Blaberus sp.

Yaguarasapa.—1892. One female. (Bertoni, No. 475).

This species is probably new and related to *B. rufescens* on one hand and the *postica* group on the other. It seems inadvisable to make a definite determination of this specimen until more material belonging to this extremely variable genus is in hand.

Blaberus sp.

Puerto Bertoni.—1905. One nymph. (Bertoni, No. 743.)

Hormetica atlas n. sp.

Type.—♂; Puerto Bertoni, Paraguay.—1905. (Bertoni, No. 420). [A. N. S. P. type, No. 5174.]

Allied to *H. laevigata* Burmeister, but differing in the more elongate pronotum and tegmina, the blackish coloration of the "horse-shoe" on the pronotum and in the non-annulate antennæ.

Size, large; form moderately depressed; surface of pronotum rugulose; of abdomen tuberculate. Head completely hidden under the pronotum; interspace between the eyes very great and equal to that between the antennal bases; face considerably flattened. Pronotum

with the lateral and cephalic margins strongly arcuate and slightly produced cephalad. The margin proper cingulate and strongly elevated and sub-lamellate cephalad; caudal margin arcuato-truncate, rather narrowly rounding laterad in the lateral margins, surface with an elevated swollen horseshoe-shaped design, the "heels" directed

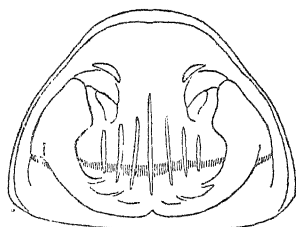


Fig. 1.—*Hormetica atlas* n. sp. Dorsal outline of pronotum of type showing general form of the elevated "horse-shoe" pattern.

cephalad and thicker and more elevated than the other portions of the pattern, having at their internal angle a blunt tubercle; area within the "horseshoe" biundulate and with seven low more or less parallel ridges, cephalad of which are several low diverging sub-arcuate folds, of which the distal is sub-tuberculate, while immediately cephalad of the elevated "heel" of the pattern is a low but acute tubercle; lateral portions of the pronotum distinctly deflected. Tegmina slightly exceeding the

length of the pronotum, subovate, width nearly three-fourths of the length, coriaceous; costal margin hardly arcuate proximad, strongly arcuate distad, apex well rounded, sutural margin straight; anal sulcus reaching slightly distad of the middle of the sutural margin. Wings falling but little short of the tegmina. Abdomen with the greatest width slightly exceeding the tegminal length, dorsum distinctly but finely tuberculate mesad; supra-anal plate damaged; cerci short, depressed, sub-fusiform; sub-genital plate distinctly emarginato-sinuate on the right side, styles lateral and extremely short.

General color tawny, darker and more rufescent on the head, pronotum, tegmina and limbs; pronotal pattern seal brown, the enclosed area dark chocolate; antennæ with the proximal joint of the color of the head, followed by seal brown fading into fawn color distad; eyes of the general color; base of the tegminal vein trunk blackish; dorsal abdominal segments with the median section of their distal halves darker than the other portion of the segments; tibial spines blackish.

MEASUREMENTS.

	♂ Type.	♀ Paratype.
Length of body	45.5 mm.	35.5 mm.
Length of pronotum	15.5 mm.	11. mm.
Greatest width of pronotum	19.5 mm.	14.5 mm.
Length of tegmen	18.5 mm.	12.8 mm.
Greatest width of tegmen	14.2 mm.	10. mm.
Greatest width of abdomen	20.5 mm.	16.2 mm.

A paratypic female (Bertoni, No. 704) has also been examined, the measurements for it being given above. It differs from the type in the characters usual in that sex of species of this genus, viz.: The smaller size, the great suppression of the pronotal "horseshoe" pattern and the absence of the marked lamellato-elevate character of the cephalic pronotal margin. The supra-anal plate is perfect in this specimen and transverse arcuate in form with the faintest possible median emargination.

***Dasyposoma nigra* Brunner.**

Puerto Bertoni.—1905. One female. (Bertoni, No. 421).

This specimen is somewhat smaller than Brunner's measurements (type from Brazil), but otherwise the Puerto Bertoni individual does not appear separable.

MANTIDAE.

***Acanthops sinuata* (Stoll).**

Puerto Bertoni.—One male. (Schrottky, No. 3).

Puerto Bertoni.—1909. One male. (Bertoni, No. 398).

This species has been recorded from Sapucay, Paraguay, and Paraguay without further locality.

ACRIDIDAE.

***Apotettix bruneri* Hancock.**

Puerto Bertoni.—One female. (Schrottky).

This is the first record of the species with exact locality.

***Sisantum gracilicornis* (Brunner).**

1910.—*Orphula gracilicornis* Bruner, ENT. NEWS, XXI, p. 301, [Puerto Bertoni, Paraguay.]

Puerto Bertoni.—One female. January 18, 1910. (Schrottky, No. 2).

Puerto Bertoni.—One female. No date. (Schrottky).

When compared with a paratype of *Sisantum notochloris*, the type of the genus *Sisantum*, and specimens of *Orphula pagana*, the type of the genus *Orphula*, we cannot agree with the original author in his generic assignment of this species. While it is true that the apex of the tegmina is narrowly oblique truncate, it is by no means the obliquely truncate apex of *O. pagana*,

while the apex of the same in *Sisantum notochloris* is not decidedly rounded, much approaching that seen in *gracilicornis*. Again the caudal femora and fastigio-facial angle are far nearer the type found in *notochloris* than in *O. pagana*, the quite elongate, little inflated femora found in *pagana* being quite different from the more robust, distinctly inflated character of these parts in *Sisantum notochloris* and *gracilicornis*.

The two specimens in hand are slightly larger than the measurements of the female sex given by Bruner.

Orphulella punctata (DeGeer).

Puerto Bertoni.—One female. (Schrottky).

This individual belongs to the form *elegans*.

Ommexecha virens Serville.

Puerto Bertoni.—One female. December 13, 1909. (Bertoni, No. 394 part).

Puerto Bertoni.—One female. No date. (Schrottky).

One of these specimens is suffused with ferruginous, while the other has a "salt and pepper" effect of gray on brownish. In response to a query regarding the color variation of individuals of this and other species of the genus, Senor Bertoni writes that "the *Ommexechae* live in communities, are very variable in color and the green and obscure individuals are encountered in copula."

Tropinotus discoideus Serville.

Puerto Bertoni.—Three males, two females. (Schrottky). Two of the males have green on the dorsum as previously described by Rehn.*

Chromacris Stoll (Pictet and Saussure).

Puerto Bertoni.—January, 1910. One male, one female. (Schrottky, No. 1).

Adimantus vitticeps (Blanchard).

Puerto Bertoni.—One female. (Schrottky, No. 6).

The following notes on the nymphal condition of this specimen have been supplied by the collector.

*Proc. Acad. Nat. Sci. Phila., 1907, p. 170.

No. 6. Nymph ♀ (the same individual I sent you after its transformation.) Food-plant: Sugar cane. January. Not common. Head above yellow with two green stripes with a black center, behind the eyes a large green spot. Face green with black shades, mouth-parts whitish, palpi with black points at apex. Pronotum yellowish green; on each side two longitudinal stripes composed of blackish green specks; mesopleuræ yellow with three blackish green transverse stripes; wings clear green. Abdomen above yellowish green, each segment on both sides with two longitudinal stripes of dark green color, so that four stripes, more or less complete, run over the dorsum of abdomen, the last segment yellow with black cerci. Legs greenish and with black spots in regular intervals; femora III yellowish, the outer side with a dark green longitudinal stripe; tibiæ and tarsi III spotted with black. Sternum yellowish with a black margin and a red patch. Venter greenish, each sternite with lateral triangular black spots.

TETTIGONIIDÆ.

Isophya melanochloris n. sp.

Type.—♂; Puerto Bertoni, Paraguay.—November 2, 1909. (Bertoni, No. 397). [A. N. S. P. type, No. 5175.]

A very distinct species of the genus with bidentate cerci, sharply pointed processes to the subgenital plate and a most striking livery of green and black.

Size somewhat large (for the genus). Head short, occiput roundly declivent to the fastigium, very slightly inflated; fastigium about half again as broad as the proximal antennal joint, sub-quadrate, sulcate mesad, distal margin broadly in contact with the broad truncate facial fastigium; eyes small, rather tumescent, ovate in outline; antennæ exceeding the body in length. Pronotum deplanate dorsad, the disc slightly expanding caudad, the caudal width contained about one and one-quarter times in the length, cephalic margin of disc sub-truncate, caudal margin arcuato-subtruncate, caudal section with a very short

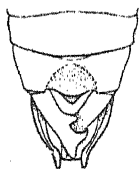


Fig. 2.—*Isophya melanochloris* n. sp. Dorsal view of apex of abdomen of type (x 5).

but decided medio-longitudinal carina; lateral angles of disc rounded cephalad, decided caudad; lateral lobes about one and one-third times as long as deep, ventro-cephalic angle sub-rectangulate, ventro-caudal angle and caudal margin regularly arcuate, humeral sinus hardly indicated. Tegmina very slightly shorter than the dorsal length of the pronotum, apex at the extremity of the principal veins and rounded, sutural margin regularly arcuate to the apex, costal margin sub-arcuate; tympanum covering al-

most the entire tegmen, transverse vein moderately robust. Abdomen inflated; terminal dorsal abdominal segment semi-elliptically depressed, medio-longitudinally sulcate, distal margin slightly obtuse-angulate; cerci straight, rather robust, apex bluntly pointed, internal face with a pre-apical and a median tooth, of which the former is slightly recurved and distally spiniform; sub-genital plate* with a pair of slightly divergent styliform processes, between which the margin is sub-truncate. Cephalic, median and caudal femora unarmed on ventral surface and without genicular spines; cephalic tibiae with the tympanum open, all four margins of median and distal sections of tibiae armed with spines; median tibiae with the margins spined; caudal tibiae very slightly longer than the femora; all tarsi without arolia between the claws.

General color apple green laterad, becoming olive green on the sides of the head and face and bistre on the dorsum of head and pronotum. Dorsum of abdomen with a moderately broad medio-longitudinal stripe of velvety black, reaching to the terminal abdominal segment. Tegmina with the costal field blackish narrowly edged with ferruginous, the area of the principal veins slightly ferruginous, discoidal field oil green, tympanum varied with rufous, seal brown and pale greenish. Antennae black, more or less ferruginous proximad; eyes chestnut. Limbs burnt umber, more or less lined and washed with seal brown; caudal femora with a broad lateral area of seal brown, proximal extremity of the same apple green; caudal tibiae largely seal brown.

MEASUREMENTS.

Length of body	22. mm.
Length of pronotum	4.5 mm.
Greatest dorsal width of pronotum	3.8 mm.
Length of tegmen	5.5 mm.
Width of tympanum of tegmen	3.8 mm.
Length of caudal femur	20.5 mm.

The type of this species is unique.

Scaphura nigra (Thunberg).

Puerto Bertoni.—November, 1909. One immature male, one immature female. (Bertoni).

Gymnocera fasciata (Brunner).

Puerto Bertoni.—October, 1904. One female. (Bertoni. No. 411).

There is some uncertainty regarding the determination of

*This is considerably mutilated in the type, but its structure is evident.

this specimen, as it has lost a good portion of the original coloration.

Phylloptera alliedea Caudell.

Puerto Bertoni.—October, 1907. One male. (Bertoni, No. 405).

Theudoria nigrolineata Brunner.

Puerto Bertoni.—One female. (Bertoni).

This species was described from Buenos Ayres, this being the next record for the species.

Theudoria melanocnemus (Stål).

Puerto Bertoni.—November, 1907. One female. (Bertoni, No. 414).

The previous records of this form were from Buenos Ayres (type) and Montevideo.

Dasyscelis normalis Brunner.

Puerto Bertoni.—November, 1905. One female. (Bertoni, No. 418).

Lichenochrus hilaris Brunner.

Puerto Bertoni.—November, 1905. One female. (Bertoni, No. 417).

This species was previously known only from Matto Grosso, Brazil.

Lichenochrus sp.

Puerto Bertoni.—November, 1909. One immature female. (Bertoni, No. 407).

Paroxyprora tenuicauda Karny.

Puerto Bertoni.—One male. (Schrottky).

Puerto Bertoni.—1905. One female. (Bertoni, No. 705).

This species was recently described from Rio Grande do Sul, Brazil, and there is some little uncertainty regarding the determination of the specimens in hand.

Xiphilimum amplipenne Caudell.

Puerto Bertoni.—January, 1910. One female. (Bertoni, No. 408).

This species was previously known only from Sapucay, Paraguay.

BERTONIELLA n. gen.

A member of the Agraeciini allied to *Lobaspis* Redtenbacher, from which it differs in having the tegmina and wings no longer than the body, in having the genicular lobes of the cephalic femora and cephalic one of the median limbs non-spinose, and in the decidedly abbreviate limbs in the male. From *Gonatanthus* Karny it can be immediately separated by the non-spinose cephalic genicular lobes, from *Anthracites* Redtenbacher by the longer tegmina and shorter limbs, from *Paralobaspis* Giglio-Tos by the absence of the peculiar fastigial development of that genus, from *Nannagroecia* by the arcuate ovipositor and from *Alphopteryx* Redtenbacher by the different tegmina.

Fastigium spiniform, contiguous ventrad with facial fastigium, antennae greatly exceeding length of body; eyes subglobose. Pronotum in male produced caudad over tegminal tympanum; humeral sinus hardly indicated. Tegmina subcoriaceous, no longer than body, apex rounded. Prosternum long bispinose. Supra-anal segment of male subangulate, fissate; cerci of male short, strongly incurved, apically toothed; sub-genital plate of male with paired styliform appendages surmounted by true styles. Ovipositor falcate, acute, margins entire. Limbs short and robust; genicular lobes of cephalic femora and cephalic lobe of median femora rounded, non-spinose, caudal lobe of median femora spinose, genicular lobes of caudal femora spinose; ventro-lateral margin of caudal femora spined, ventro-cephalic margins of cephalic and median femora each with several spines.

Type.—*B. agraecioides* n. sp.

We take pleasure in dedicating this most interesting genus to Senor A. de Winkelried Bertoni, who collected the type and who has done so much to make known to science the rich fauna of Paraguay.

Bertoniella agraecioides n. sp.

Type.—♂; Puerto Bertoni, Paraguay.—November, 1909. (A. de Winkelried Bertoni.) [A. N. S. P., type No. 5176.]

Size, rather small; form, robust. Head broad, occiput nearly horizontal; fastigium narrow, spiniform, apex rounded, not extending cephalad of the proximal antennal joint; eyes globose, but little prominent; antennæ with proximal joint swollen on internal face. Pronotum with greater dorsal width contained more than twice in length of same, caudal section of disk produced caudad in an arcuate extension covering almost the entire tympanal field of tegmina; cephalic margin of disk truncate; lateral lobes with their greatest depth contained over

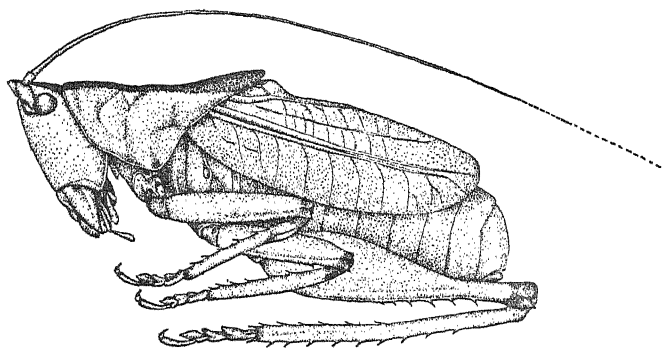


Fig. 3.—*Bertonietta agraeioides* n. gen., n. sp. Lateral view of male type (x 3).

one and one-half times in greatest length; ventral margin oblique truncate, ventro-caudal angle obtuse-angulate, caudal margin oblique truncate, humeral sinus hardly appreciable. Tegmina sublanceolate, about reaching base of supra-anal segment, costal margin arcuate distad, apex rounded, structure coriaceous, subreticulate. Wings distinctly but not greatly shorter than tegmina. Supra-anal segment (terminal dorsal abdominal segment) very narrowly fissate for about one-third of its length, margin very obtuse-angulate; cerci with lateral face of proximal portion decidedly and roundly excavate; subgenital

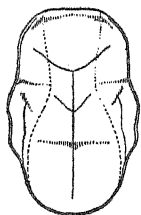


Fig. 4.—*Bertonietta agraeioides* n. gen., n. sp. Dorsal outline of pronotum of male type x 3).

plate with styliform appendages fairly robust, parallel, separated by about the width of one appendage, true styles short. Cephalic femora about two-thirds as long as the pronotal disk, armed with three spines distad on the ventro-cephalic margin, ventro-caudal margin unarmed; median femora slightly shorter than cephalic pair, similarly armed; cephalic tibiae with tympanum cleft-shaped, cephalic and median tibiae unarmed dorsad, armed on both margins ventrad; caudal femora about as long

as the tegmina, decidedly inflated in the proximal two-thirds, distal portion narrow, lateral margin with five to six distal spines, internal margin with one or two distal spines; caudal tibiae subequal to the femora in length, very slightly bowed.

General color ochraceous, the limbs approaching tawny ochraceous; dorsum of head and entire dorsum of pronotum brownish black, this narrowing cephalad and extending over the dorsal surface of the fastigium; genicular regions of the femora and tibiae, a spot at the distal extremity of tympanal slit and less clearly defined areas at the tips of the tibiae brownish black; eyes chestnut; antennal scrobes brownish black; tegmina with the anal field strongly suffused with dark brownish, costal and discoidal fields with a few scattered irregular spots of brownish black.

MEASUREMENTS.

	Type ♂	♀
Length of body	22.5 mm.	26.5 mm.
Length of pronotum	9.2 mm.	8.5 mm.
Greatest (caudal) dorsal width of pronotum	4.2 mm.	4 mm.
Length of tegmen	13.5 mm.	16 mm.
Length of caudal femur	13 mm.	16.2 mm.
Length of ovipositor		13 mm.

A female of this species taken by Schrottky at the type locality (without recorded date) gives the measurements entered in the above table with those of the type. The characters of disagreement with the male description are here given.



Fig. 5.—*Bertoniella agraeoides* n. gen., n. sp. Outline of ovipositor of female type (x 2).

Pronotum with caudal development of disk much less than in male, although of similar shape; caudal margin of lateral lobes slightly sigmoid, the humeral sinus hardly marked. Ovipositor nearly equal to caudal femora in length, rather broad, falcate; subgenital plate small, produced trigonal; apex rather broadly fissate. Color

as in male, ovipositor of general color.

Lutosa paranensis* n. sp.

Type.—♂; Puerto Bertoni, Paraguay.—October, 1909. (Bertoni, No. 410). [A. N. S. P., type No. 5177.]

Allied to *L. brasiliensis* (Brunner), from Santa Catharina, Brazil, from which it differs in the hardly curved caudal tibiae and considerably smaller size.

**Pherterus* of authors.

Size medium; form robust, moderately compressed; surface polished. Head with the occiput roundly declivent to the subvertical fastigium, which is slightly broader than the proximal antennal joint; margin bluntly acute-angulate; antennæ over twice the length of body, proximal joint elongate, cylindrical; eyes not at all prominent, pyriform; apex ventrad. Pronotum with the greatest width contained about one and one-third times in the length; cephalic and caudal margins, subtruncate; lateral lobes arcuate-angulate ventrad, ventral angles rounded. Cerci moderately elongate, slightly tapering, apex acute; subgenial plate rectangulate emarginate caudad, styles flanking the emargination and of fair length. Cephalic and median limbs similar in size and spine development. Caudal femora very robust, the proximal three-fourths inflated, margins unarmed, external face with a regular pattern of oblique arcuate dorso-caudad impressed lines; caudal tibiæ nearly straight; principal internal caudal spur reaching to the apex of the third tarsal joint, claws without arolia.

General color deep tawny ochraceous, ventrad becoming buffy and dorsad becoming suffused with seal brown; a medio-longitudinal line on the abdomen is deep ochraceous rufous; pronotum with the seal brown narrowed and much of the dorsum deep ochraceous, a narrow median line and large lateral patches of this color being present; eyes, black; antennæ ochraceous; fastigium and dorsum of head of the dorsal color; face dirty clay color with the ocelli clear buff.

MEASUREMENTS.

Length of body	19.5 mm.
Length of pronotum	7.2 mm.
Greatest width of pronotum	6.2 mm
Length of caudal femur	18. mm.

The type is the only specimen of the species seen by us.

GRYLLIDAE.

Rhipipteryx brullei Serville.

Puerto Bertoni.—Two females. (Schrottky, No. 4).

Eneoptera surinamensis (DeGeer).

Puerto Bertoni.—October 5, 1909. One female. (Bertoni, No. 406).

ABUNDANCE OF COSTA RICAN BUTTERFLIES.—Mr. William Schaus reports that he took 150 species of *Thecla* in Costa Rica (64 are mentioned in the *Biologia* as from that country) and over 300 species of *Hesperidæ*.

***Lycaena enoptes*, *battoides* and *glaucou* (Lepid.).**

BY HENRY SKINNER, M.D., Philadelphia, Pa.

This is a comparative study from the specimens at hand, no types having been seen and the descriptions being relied on. These three names represent the great difficulties encountered in a study of our butterflies, especially species of some of the earlier authors. The name species represented quite a different idea from what it does to-day, and slight differences in appearance were often taken to represent distinct entities in nature. I could never with any degree of satisfaction find butterflies that would adequately fit these three names as distinct species. The type of *battoides* Behr, I assume, was destroyed in the San Francisco fire. The type of *enoptes* Boisduval may, or may not, be in the Oberthur collection in Rennes, France, and the type of *glaucou* Edwards is doubtless in Dr. W. J. Holland's collection in Pittsburg, Pennsylvania.

After a careful study of the original descriptions, in conjunction with a fair amount of material, I have come to the conclusion that the three names represent but one species. *Battoides* I take to be a variety of *enoptes*, and *glaucou* also a slight variety. I have studied sixty-five specimens from the following localities:

California material has been received from Havilah, June 11 (F. Grinnell, Jr.), also June 19, Pasadena; June 7 and 13 (Louis Wanka); Soldiers' Home (Max Albright); Brodie, July 3 (H. F. Wickham); Truckee, Sierra Nevada; Los Angeles, June 7; Eldorado County, June 19 (6800 ft.). There are also specimens with only a State label.

Las Vegas, Nevada, May 1 and June 5 (Thomas Spalding).

Fort Klamath, Oregon, June 12 to 26 (B. L. Cunningham).

Chimney Gulch, Colorado, June 18 and 20 (E. J. Osler). These are the only Colorado specimens with accurate data, the others bearing a label "Colorado, Bruce."

Park City, Utah, July 1 and 3 (A. J. Snyder); City Creek Canyon, Salt Lake City, Utah, July 5 (Henry Skinner); Stockton, Utah, June 10 to 26 (Thomas Spalding), also July 3; Provo, Utah, July 28, 30 (Thomas Spalding).

I have compared them according to the following original descriptions:

Enoptes.

Primaries above.

Violet blue, with a rather wide black border; the fringe intersected with white and black.

Primaries below.

Ashy white, with a great number of black ocellate points.

Secondaries above.

Violet blue, with a rather wide black border.

Secondaries below.

Ashy white, with a

Battoides.

Primaries above.

Wings of male of this species above blue, broadly margined with black, fringes checkered.

Primaries below.

Whitish, with two basal dots in a transverse black band hardly bent backward and confluent with the discoidal line, a series of ordinary quadrangular black dots, a double submarginal series and no black margin.

Secondaries above.

Blue, broadly margined with black, fringes checkered; provided with several yellow submarginal lunules.

Secondaries below.

Three basal black

Glaucous.

Primaries above.

Male expands 0.95 inch. Pruinose blue, color of *comynus*; blackish border to hind margin of equal width throughout and even edged within; fringes short, white, cut with black at ends of nervures.

Primaries below.

Grey-brown, a marginal series of brown spots or imperfect lunules, preceded by a submarginal series of larger, distinct, blackish spots, the two next inner angle suffused with fulvous; a median row of large blackish spots, the uppermost ones much advanced on costa; a subreniform spot on arc and a smaller spot in cell, both blackish.

Secondaries above.

Pruinose blue, color of *comynus*; rather wider border (than in primaries), lunate within and less distinctly defined, the two lunations before anal angle surmounted with fulvous.

Secondaries below.

A distinct marginal

great number of black ocellate points; the two striae of posterior points are separated on the secondaries by a series of five yellow lunules.

dots and a fulvous band which reaches to an internal series of submarginal dots, but not to the external series of dots nor to the anterior apex.

row of round brown spots, preceded by a second similar row, but which are partly lost in a bright orange stripe that occupies the space between the two rows from anal angle nearly a cross wing; median row similar to that of primaries; a bent bar on arc; two rounded blackish spots a little posterior to this bar and between it and costa; a third spot on costa nearer the base and a fourth below cell.

"It is found in May on dry hills" (California).

"Head-waters of San Joaquin Valley, California, eleven thousand feet."

"Allied to *battoides* Behr. From two males and one female taken by Mr. Henry Edwards in Nevada."

The larger number of specimens examined are males and the above descriptions refer to males only, the females not presenting any discoverable differences except in size. The males differ in expanse from 14 mm. to 25 mm., the smallest specimens being from Pasadena, Los Angeles and Havilah, California, and from Las Vegas, Nevada. The largest came from Provo, Utah. The specimens taken in July are all large and are the only ones having fulvous on the underside of the primaries. These are evidently a second brood, the first appearing in May.

Enoptes may be taken as the species, having been described previous to the other two. The black border varies considerably in width, being from 1 mm. to 2 mm. One specimen from Fort Klamath, Oregon, has the border 3 mm. in width. The amount of orange on the underside of secondaries varies considerably and in some specimens it is entirely absent. Variety *battoides* has sub-marginal fulvous spots on the secondaries

above. In the series from Fort Klamath, Oregon, some show this character and some do not. I restrict the name *battoides* to the specimens having this fulvous. This form is well figured in Dr. W. J. Holland's *Butterfly Book*, Plate 32, fig. 11. *Glaucion* I have restricted to the variety having two sub-marginal fulvous spots near anal angle of upperside of secondaries and having on the underside of the primaries the two spots next inner angle suffused with fulvous. Having fulvous markings on the underside of the primaries is an unusual condition judging from the material at hand.

It will be noted that the types of *glaucon* came from Nevada, whereas Mr. Edwards in his Catalogue of 1884 credits it to Colorado only. The Utah specimens are somewhat lighter in color than those from California, Nevada or Oregon, and there is more of a tendency for the marginal border of the secondaries above to break into spots. Some specimens from Havilah, California, and Las Vegas, Nevada, have a more brilliant luster (Morpho-like) and are quite small.

I would like very much to have additional specimens of any of these forms from any locality and I will also be pleased to name specimens. The student can make his own deductions from the original descriptions presented; my own studies and conclusions are here given for what they may be worth.

INTENSIV AGRICULTURE.—The letter-heads used by the Iowa State College of Agriculture and Mechanic Arts, Department of Zoology, including the Office of the State Entomologist, bear the legend "Spelling authorized by the Simplified Spelling Board used in this office." Strange to relate, the agricultural and mechanic arts, the cultivation of agricultural zoology, and the regulation of the insects of the State, go on just the same—indeed a little better. Because scientific simplification applied to one department of life is sure to promote simplification in other departments of life. Spelling in accordance with reason will thus lead to the reduction of insect pests, and therefore increase the crops. If you do not believe this, state the opposite case, and tell us whether you believe that. Agriculturists have always tended toward simplicity of spelling, and here is a financial reason to confirm their views.—*Simplified Spelling Bulletin*, March, 1911.

A new Sawfly of Economic Importance* (Hymen.).

By S. A. ROHWER, Washington, D. C.

Some time ago Mr. R. A. Cushman, who was at that time stationed at Tallulah, Louisiana, sent to the Bureau of Entomology a sawfly which was found defoliating the peaches in that locality. The specimens sent represent a new species belonging to the genus *Caliroa* (sub-genus *Eriocampoides*), and are herewith described. The habits of this species have been studied by Mr. Cushman, and will be described in a paper to be published by the Bureau of Entomology. Mr. Cushman states that they differ in a number of ways from those of the common pear slug, although the larvæ and work are superficially similar.

The accompanying figures were prepared from camera lucida sketches, and the description was made with the aid of a Carl Zeiss binocular with a magnification of thirty-five diameters.

Caliroa (*Eriocampoides*) *amygdalina* new species.

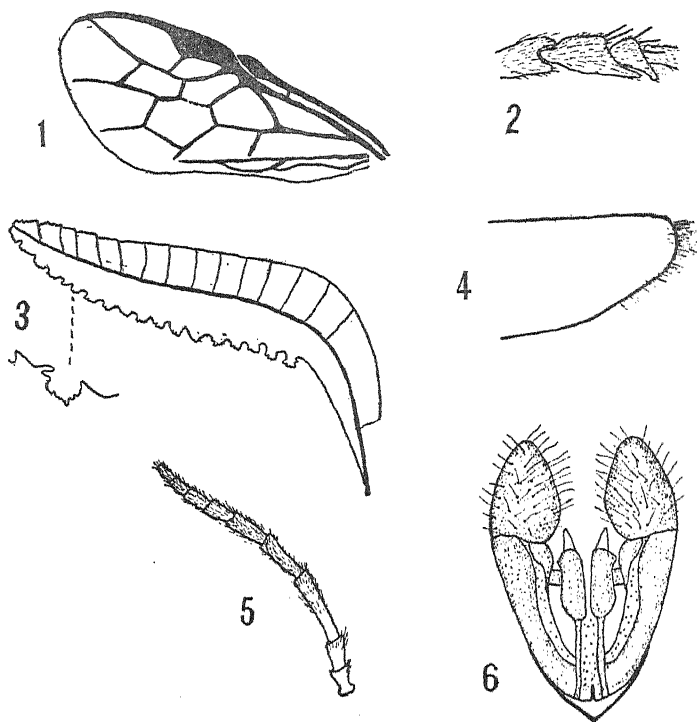
Related to *C. (Eriocampoides) quercus-coccinea* (Dyar), but the frontal foveæ are small, well defined, punctiform, not large and poorly defined; the third and fourth posterior tarsal joints have projections beneath; the stigma is shorter; the wings uniformly dark; the transverse radius is received basad of the middle of the cell, not beyond the middle; and the saw has small, separate dorsal teeth, and larger ventral ones.

Female.—Length 3.5 mm. Labrum broadly rounded, granular; clypeus broadly emarginate, somewhat angular, the lobes broad, triangular; supraclypeal area convex throughout its entire length, not mound-like; antennal foveæ rather small; middle fovea not sharply defined, large, somewhat circular in outline; frontal foveæ† small, sharply defined, punctiform; sides of the pentagonal area ridged as in *quercus-coccinea*; ocellar basin shallow, circular in outline; postocellar furrow wanting; postocellar area twice as wide as its cephalo-caudad length; antennæ hairy, the third joint much longer than the fourth, but shorter than the fourth

* Contributions from the Division of Forest Insects, Bureau of Entomology, Department of Agriculture.

† The term "frontal foveæ" is used for the foveæ which occur in some species, in the antennal furrows near the frontal crest.

and fifth combined; stigma robust, about three times as long as the greatest width, widest where the transverse radius leaves it, oblique from the transverse radius; the third cubital cell but little broader apically, receiving the transverse radius distinctly basad of the middle; hind wings without closed discal cells; the third and fourth joints of the posterior tarsi with long apical projections beneath; sheath rather narrow, straight above, broadly rounded below, the apex with a tuft



Caliroa (Eriocampoides) amygdalina.—Fig. 1, anterior wing of female; 2, third and fourth joints of the hind tarsi of female; 3, saw; 4, apex of the sheath; 5, antenna of female; 6, dorsal aspect of the genital armature of male.

of white hair; saw slender, dorsally with small teeth apically, ventrally the teeth are large and are themselves dentate (see Figure 3). Black; the four anterior tibiae and tarsi, the basal half of the posterior tibiae and the post-basitarsus white, or whitish; wings uniformly blackish, venation dark brown.

Male.—Length 3 mm. Very like the female, but the middle fovea is

rather smaller and more sharply defined, and the sides of the pentagonal area are not as sharply defined. The hypopygidium is rather short, and is broadly rounded apically; the genital stipes are large and broadly rounded apically, greatly exceeding the hypopygidium. The posterior tibiae, beyond the middle, and the posterior tarsi are black or strongly infuscated.

Type-locality.—Tallulah, Louisiana. Many specimens reared by Mr. R. A. Cushman from larvae on peach. Some of them under the Bureau of Entomology number "Hunter 1936."

Type.—Cat. No. 13,371, United States National Museum.

Concerning *Archylus tener* Druce (Lepid.).

By WM. BARNES, M.D. and J. McDUNNOUGH, Ph.D.,
Decatur, Ill.

In the Proc. Ent. Soc., Wash., Vol. VI, p. 65, Dr. Dyar records this species from southern Arizona, expressing at the same time some doubt as to the correct generic position of this insect. In the Proc. Ent. Soc., Wash., Vol. XII, 1910, he places the species in the genus *Norape*, stating (p. 167) that "the single type specimen has veins 3 and 4 of hind wing connate, 4 and 5 of fore wing separate, *although very shortly so*. It therefore must be placed in this genus. The Arizona form, supposed to be the same as the Mexican *tener* is referred to here under the genus *Ramaca*." On page 173 of the same journal he creates the genus *Ramaca* with *pascora* Schaus as type species, merely stating that this genus differs from *Mesoscia* Hbn. "in having veins 4 and 5 of fore wing and 3-4 of hind wing connate." He then describes as a new species *R. achriogelos* from a single male specimen from southern Arizona, remarking, "Very like *Norape tener* Druce, but differing in venation." If, as must be inferred from Dr. Dyar's remarks, the only point of difference between *tener* and *achriogelos* is in the venation, we fear that our worthy friend, from lack of material probably, has created a synonym.

We have examined a series of 37 specimens from Cochise

Co., Arizona, in the Collection Barnes, and have found a single specimen among them in which veins 4 and 5 of the fore wing are distinctly separate, *although very shortly so* just as Dr. Dyar states is the case with the type of *tener*. The remaining specimens fall in about equal numbers into two groups, having veins 4-5 either stalked or from a point. In one case there was an extra vein between veins 3 and 4. The specimen with veins separate differs in no respect from the others, and all agree exactly both with the description and the figure given in the Biol. Cent. Amer. Dr. Dyar's description of *achriogelos* would also apply equally well to *tener*.

With regard to the hind wings of the specimens before us, most of them have veins 3-4 from a point (connate.) Several specimens however show these veins very distinctly *but shortly* separate. As the genera *Mesoscia* and *Ramaca* are separated by Dyar on the strength of veins 3-4 of hind wings being separate or connate, it is rather doubtful whether *Ramaca* Dyar will hold. As however we have no South American material before us, we leave this point to be decided by more competent authorities than ourselves.

To return to *tener*, we consider then that *achriogelos* Dyar is an absolute synonym, the slight difference in venation in the type of *tener* being due to mere accidental variation. As to the genus into which this species should be placed we are rather at a loss to decide. Dr. Dyar has removed it from *Archylus* and placed it in *Norape*; it cannot remain there, however, as veins 4 and 5 of fore wing are more often connate or stalked than separate; it is shut out from *Ramaca* owing to the fact that veins 3-4 of hind wings are sometimes separate, which would place it in the genus *Mesoscia*. It seems to vacillate between these two last named genera and has become an outcast and a wanderer, surely a harsh fate for such a delicate species. Let us hope it will find a firm abiding place without the necessity of creating still another new genus.

Some Remarks on *Mastor bellus* and *M. phylace* (Lepid.).

By WM. BARNES, M.D., and J. McDONNOUGH, Ph.D.,
Decatur, Ill.

In the January number of the Canadian Entomologist for 1911, page 6, Mr. Coolidge, in an article on the genus *Mastor*, arrives at the conclusion that *M. bellus* and *M. phylace* are but the spring and summer broods respectively of one and the same species. He bases his conclusion on the fact that he has taken *bellus* abundantly in the Huachuca Mts. of Cochise Co., Ariz., from the end of May until about the middle of July and that Mr. V. L. Clemence has given him several specimens taken July 18th and 26th in the Chiricahua Mts., Cochise Co., Arizona, which "have the fringes of a pale, dirty, creamish color, answering perfectly to the description of *phylace* Edw." Without stating any reasons he jumps to the conclusion that these second specimens must be the second brood of *bellus*, in other words, that a species taken in one locality in the latter half of July is but a seasonal form of another species taken in an entirely different locality by a different person from the middle of May until the middle of July. Without additional proof such a statement as this is absolutely worthless; in fact, until satisfactory evidence is given that ova deposited by the early females produce imagines corresponding to the other form, seasonal dimorphism cannot be definitely accepted.

In the case in point it is our opinion that we are dealing with two nearly related but clearly distinct species. We have examined carefully series of both species, contained in Collection Barnes, and including specimens which have been compared with the actual types. The *bellus* are all from the mountain districts of southern Arizona and include specimens taken in May and June and others taken July 24-30, showing the species is probably double-brooded, as stated by Coolidge. No difference however between the two broods can be noted.

Our *phylace* are from southern Colorado and New Mexico, several bearing the date June, which would tend to upset the seasonal form theory.

As further evidence for the distinctness of the two species, we would call attention to the great and constant difference in the stigma on the fore wing of the males, a point which has always been considered of excellent specific value, and which is used in Europe with great success in separating the nearly allied species *lineola* and *thaumas*. In *bellus* the stigma is long and narrow, consisting usually of three distinct tufts of black hair, extending in a line from the space between veins Cu1 and Cu2 across the former to the anal vein. In *phylace* the stigma is much shorter and somewhat stouter: it consists of two tufts of hairs and is largely confined to the space between Cu1 and Cu2, extending but for a short distance across Cu1 and never reaching the anal vein.

With regard to *M. anubis* G. & S. and *M. bicolor* Mabille, which Coolidge is also inclined to place as synonyms of *phylace*, we are unacquainted with either of these species, but would advise great care in making synonyms of species merely because the descriptions or figures appear to fit in fairly well with each other. Sufficient confusion has already been caused among our North American Lepidoptera by such procedure, and unless one has had access to the actual types themselves, or to specimens compared with the types by some reliable authority, it would be well to hold before one the motto advocated by the guides in the Alps of Switzerland, "Hurry slowly."

Arrangement of the Species of *Dendrocoris* Bergr., with the Descriptions of two new Species (Hemip.).

BY H. G. BARBER, Roselle Park, N. J.

In my paper on the "Hemiptera from Southwestern Texas," published in the "Bulletin of the Museum of the Brooklyn Institute of Arts and Sciences," Vol. I, No. 9, 1906, I described *Dendrocoris schaefferi* and gave a synoptic key for distin-

guishing the known species of the genus. At that time I did not have Dr. Bergroth's paper in which he had described *D. fruticicola*, and I depended for my diagnostic characters upon a specimen labelled as such, received from the National Museum. The recent acquisition of Dr. Bergroth's paper and several specimens of the true *fruticicola* from Florida, kindly presented to me by Mr. Van Duzee, has shown that the species so indicated in my key is distinct, which I here describe as *D. reticulatus*. I collected several specimens of this species in the Huachuca Mountains, Arizona, in 1905, as well as another undescribed species which I have called *D. arizonensis*. This brings the total number of species of the genus *Dendrocoris* up to seven, which may readily be separated by the following synoptic table:

Head incised in front, with lateral lobes not in contact.

Humeri strongly prominent and very acute *schaefferi* barb. Tex.

Head rounded in front, with lateral lobes more or less in contact.

Humeri rounded, not at all prominent, barely projecting beyond lateral margins of hemelytra.

Lateral margins of prothorax somewhat convexly arcuated.

pini Mont.—S. W. States

Humeri more or less rounded or obtuse, projecting well beyond costal margins.

Lateral margins of prothorax concavely arcuated.

Anterior one half of pronotum infuscated; connexivum without a small black spot at incisures.

contaminatus Uhl.—S. W. States.

Anterior half of pronotum concolorous; connexivum with a black spot or band at incisures..... *humeralis* Uhl.—U. S.

Lateral margins of prothorax nearly straight.

Veins of membrane reticulated. Lateral margins of prothorax impressed and impunctate *reticulatus* n. sp.—Ariz.

Veins of membrane normal. Surface of pronotum punctured to the margins, which are not impressed.

The stigmata, extreme apical angle of abdominal segments above and below and large spot at each incisure of the connexivum, next the costal margin, black.

fruticicola Bergr.—Fla.

The stigmata concolorous; extreme apical angle of abdominal segments below and with a band at base and apex of each abdominal segment of the connexivum, black or fuscous..... *arizonensis* n. sp.—Ariz.

***Dendrocoris reticulatus* new species.**

Color pale ochraceous. Form short and broad. Head short and broad, lateral lobes slightly in contact before tylus and leaving the rounded apex slightly incised. Lateral edges lined with black and slightly concave before eyes. Whole surface of head coarsely and evenly punctured with pale castaneous, punctures becoming blackish towards sides. Antennæ except for stramineously colored basal segment, pale rufous; second joint slightly longer than basal, third about one-third longer than second, slightly incrassate, fourth and fifth joints subequal in length and somewhat longer than third. Head beneath except anteriorly and laterally coarsely, concolorously punctate. Pronotum and scutellum coarsely punctured with pale castaneous, punctures arranged somewhat in irregular broken transverse rows. Sharply impressed lateral edge of pronotum almost straight, concolorous, impunctate. The median longitudinal ridge very faint. Humeral angles rather prominent, rounded; surface elevated within. Scutellum short and broad, with apex narrowly rounded. Pale castaneous punctures of the corium, more scattered on the disc, leaving some irregular smooth areas between exterior vein and clavus. Membrane suffused with pale fuscous and with the nervures pale and much reticulated. Expanded surface of the connexivum concolorous with the corium, rather sharply and coarsely punctured with pale castaneous, these sometimes more or less blackish next the incisures; apical angle of each segment tipped with black. Beneath paler with prosternum coarsely punctate with pale castaneous, meso- and metasternum except posteriorly with few punctures. Legs pale stramineous, shaded with rufous towards apex of tibiae and tarsi. Disc of venter smooth, laterally with scattered rufous punctures. Rim of spiracles and outer apical angle of segments 2-6 black. Lateral impressed lobes of the genital segment of the male punctured. Length of ♂ 6.5 mm., ♀ 7.5 mm. Humeral width about 5 mm.

Described from five males and three females in my collection taken in the Huachuca Mountains, Arizona, and one ♀ specimen in the collection of the United States National Museum from Oracle, Ariz., which bears the label *Dendrocoris fruticicola* Bergr. In some specimens the punctures on the sides of the head, pronotum, corium and venter are blackish.

***Dendrocoris arizonensis* new species.**

Very closely related to *D. fruticicola* Bergr. It will average a little larger and proportionately broader. Ground color pale stramineous closely punctured with castaneous. Humeri are equally prominent as in *fruticicola* but usually more rounded. The connexivum is pale

fulvous, closely and concolorously punctate except at base and apex of each segment where the surface is smudged with fuscous encircling the smooth pale callosed edges of the incisures; lateral margin of connexivum either side of incisures black. All beneath and legs entirely clear pale stramineous, with lateral edges of abdomen either side of incisures of segments 2-5, tip of 6th and edges of genital segment of ♀, black. Spiracles concolorous. In the female the side pieces or lateral lobes of the genital segment are placed in a line with the long axis of the body and elongate, while in *fruticicola* these pieces are set more obliquely and not so much drawn out to an acuminate apex. Length of ♂ 7.5 mm., ♀ 8.5 mm.

Described from one male and two females collected by me in the Huachuca Mountains, Arizona, July, 1905.

On Some Rare *Cicindela* (Coleop.).

By R. P. Dow, New York City.

Among the material received last year from Mr. John Woodgate, Ft. Wingate, New Mexico, were long series of a *Cicindela* labelled by him *vulturina*. All were taken in July and August, and were about equally divided between black and green forms. The former agree perfectly with the description of *santaclarae* Bates. The earlier insects are generally green. A month later the black predominates. Both forms are the same insect, beyond a doubt, but examination of elytra under a strong lens with transmitted light shows that the amount of pigment in the black form is easily twice that of the green, and the color of the former mainly due to broken light rays, rather than pigment. The black color is piceous. In over 300 specimens there are no intermediates. I therefore suggest the varietal name *anita* for the black form. It is not ill known already to collectors.

In the same material I found two specimens which are beyond a doubt *sperata*. I have a good share of the color forms recognized in the E. D. Harris catalogue. The amount of pigment in all these forms is about equal and the color due almost entirely to broken light rays. My two specimens are light emerald green. All others of the species that I have seen

range through the gray, red and brown tones. I understand that Dr. Henry Skinner first noticed this emerald form and wrote to some specialists suggesting that it ought to be named. Both Mr. C. W. Leng and Mr. E. D. Harris concurred in that opinion, but both were generous enough to suggest that I name it. Hence the proposed varietal name *marutha*. Anyone who understands the spectrum can hardly expect an intermediate between two colors so far removed.

A year ago last June I caught a few *Cicindelas* in my hand, (having left net at home), at DeBruce, Sullivan County, New York. Three specimens were distinctly olivaceous. They were, however, *ancocisconensis*, as all agree in New York. I gave one such to Mr. Leng and Mr. Harris and retain the third. Next year I went back in June. Mr. Harris and Mr. W. T. Davis went in June and August, the last week in each. We took large series of *ancocisconensis*, but all typical in color.

They are extremely local, found only on the roadway along the Mongaup river for the first three miles from DeBruce village. It is to be hoped that some collector will make a catch this year. Anyone interested will receive full information about locality if he will enclose postage for reply. *Repanda* and *tranquebarica* fly with them.

Sexguttata is common in the fall months on the Mongaup road. In June the form on the Willowemoc road is entirely *harrisii*. So far as I can observe these two forms do not meet. I took one *harrisii* (which I gave to Mr. Leng), with head and thorax colored like *purpurea*. They fly together and I have seen male *purpurea* and female *harrisii* with unmistakable understanding between them. *Punctulata* is common over the same road, but from midsummer only. I have never seen *sexguttata* on this road. The evidence so far tends to substantiate Mr. Leng's claim for *harrisii* rather than Dr. W. Horn's curt dismissal. It is worthy of speculation whether *harrisii* did not originate from natural hybrids of *purpurea* blood.

THE entire collections of British and exotic Hymenoptera, the Palaearctic Hemiptera and the microscopical preparations of the late Edward Saunders, F. R. S., are now in the Natural History Museum at South Kensington, London, S. W.

Some new Beetles from North Carolina, with Ecological Notes (Coleop.).

By CHARLES DURY, Cincinnati, Ohio.

From June 16 to July 6, 1910, I collected insects in the Plott Balsum Mts., N. C. Every day of that time it rained. Sometimes it poured for hours at a stretch, frequently all night, though generally there were a few hours each day when the sun was shining. But few diurnal Lepidoptera were seen, and they the most common species. Diptera and Hymenoptera were also very scarce. Coleoptera were more abundant, though mostly of common well known species. The rainfall at this season in these mountains is tremendous. The superintendent of the fibre mills at Canton told me that it rained one summer 90 consecutive days since he had been there, at least a shower each day. A few new species of Coleoptera were secured, three of which are here described. In addition, I enumerate some of the more interesting and desirable species taken.

Cychri were not abundant. They were *canadensis*, *bicarinatus*, *andrewsii* and *guyotii*. About a dozen species of *Pterostichus* were identified among which were *P. spoliatus*, *blanchardi*, and *palmi*. *P. adoxus* was very abundant as was *Platynus angustatus*, which merged into the one described as *gracilentus* by intergrading forms. Three times I climbed to the top of "Jones' Knob" (over 6,000 feet), each time to be driven back by a deluge of rain. From the trunk of a felled balsam tree some huge blue *Anthophilax* had recently emerged; I found dead and broken ones but none living. A few *Emmusa connectens* Newm. were taken from under bark. Beating the large flowers of *Rhododendron catawbiense* brought down showers of beetles mostly Longicorns of five or six small species.

Coiled under the bark of a fallen tree, I counted 14 beautiful little snakes of three species. The male snowbirds (*Junco*) were singing and several nests were found, all located on the ground. One of July 1, had four fresh eggs in it. The concealment of this nest was so ingenious and perfect, it never could have been found had I not noted the bird fly out of it. It was on

a sloping bank with a lace-like screen of ferns hanging down to hide the entrance.

The growth of fungus was prolific, and some of the plants huge in size. *Oxyphorus* and other Staphylinidae were plenty in these fungi. From one small *Agaricus*, about 2 inches in diameter, 24 *Oxyphorus 5-maculatus* were taken. Under bark a few *Hypoteles capito* Lec. were found, in company with *Rhizophagus minutus*, and other flat species modified for an existence in the narrow crevices of close-lying bark. Beneath a flat stone in a nest of *Termes* were a number of *Trichopsenius*, curious little Staphylinids that are only found associated with *Termes*. When I had picked up three of the active little beetles, the rain came down in torrents. I replaced the stone over the nest, but next day when I went back hoping to get more, the *Termes* had departed, and their guests had gone with them. Of Pselaphidae, *Adranes coecus* was found in a nest of black ants under a slab. *Euplectus crinitus* and a large *Batrissodes*, perhaps a new species, together with *B. globosus* and *virginiae* occurred under bark. *Centrodera decolorata* was beaten from foliage and came down amid a shower of water. Flying about among the wet weeds on the mountain sides were many scorpion flies, of the genus *Panorpa*, *P. signifer* and *P. maculosa* especially abundant.

At night many moths and beetles came to light and some fine ones were captured. In this work I was ably assisted by a setter dog belonging to the manager of the Lodge. The intelligence of this dog was a marvel. After chewing up several specimens, his master told him not to bite them. He evidently understood for after that he knocked the beetles down with his paw and held them until we bottled them. The only *Acanthocinus nodosus* taken, was caught in this way by the dog. This dog seemed to understand what we were doing better than the mountaineers, one of whom said to the manager of the Lodge, "What was the matter up to your house last night? I seen a feller jumping around on your porch waving a white flag." He had evidently mistaken our butterfly net for a flag of truce. Four species of *Lachnosterna* came to light, the most common of which was *L. corrosa* Lec.

Less than 250 species of Coleoptera, and most of them common, were identified on the trip. Rather a disappointment considering the hard work done. Among the unidentified species the following seem to be new:

Pinacodera virescens n. sp.

Head and thorax piceous black, shining. The thorax with wide pale border, wider behind. Hind angle obtuse, margin punctured and transversely wrinkled. Elytra dull opaque green, strongly alutaceous. Legs and antennae pale. Length 9 mm.; width 4.50 mm.

One male.—Plott Balsam Mts., North Carolina, June, 1910, As compared with the other North American species, this is a shorter and broader insect.

Scaphisoma (Scaphiomicrus) carolinae n. sp.

Black, shining. Punctures of prothorax very minute, those of elytra slightly coarser. Each elytron with a sharply defined rufous spot near base, rounded in front and extending obliquely back to apex, leaving a triangular black area on dorsum of elytra, which area extends three-fourths way to elytral apex. Sutural striae flexed outward at base in male, straight in female. Beneath strongly punctured, except the last four ventral segments. Postcoxal plates not reaching one-half the length of basal segment. Parabolic in form behind. Three specimens, 1—9 mm.

Balsam, North Carolina, June, 1910. In fungus. This species recalls Mr. Fall's *S. ornata* from Alabama, but is larger, much broader, elytral maculation different and punctures finer.

Athous lengi n. sp.

Color ochre-yellow with an oblong piceous cloud in middle of thorax, extending from base to apex, and another along elytral suture from scutellum to apex. Thorax closely and strongly punctate, elytra and body beneath more finely so. Antennal joints of male more serrate than in female. Second joint short, third to eleventh subequal in length. Front coxae covered with dense fine pale buff-colored pubescence. Male 13 mm., and female 16 mm. long.

One from Balsam, North Carolina, and one from Clayton, Georgia. One also taken at Clayton by Dr. Lore of New York, June. A large stout species that recalls in facies the female of *Corymbites longicornis* from North Carolina, and *Athous vittiger* from the State of Washington, though very different structurally. Named in honor of Chas. W. Leng, of New York.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, four weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.—Ed.

PHILADELPHIA, PA., JUNE, 1911.

It will probably be of interest to the younger entomologists to know something of Major John Eatton LeConte, whose picture appears on the covers of this year's issues of the NEWS, and will be placed on the title-page of the completed volume. "He was born in Shrewsbury, New Jersey, in 1784 and died in 1860, having lived most of his life in New York. Entering the corps of topographical engineers of the United States Army with the rank of captain, at the age of thirty-four, he remained in the government service until 1831, attaining the rank of brevet-major in 1828, for ten years' faithful service. His tastes were many sided, but his special studies, those which were the passion of his life, were in natural history. Before he entered the engineer corps he published a catalogue of the plants of New York City in the journal edited by Dr. Hosack, under whom his brother had studied medicine, and in subsequent years, during his connection with the army and afterwards, he published special studies on *Urtricularia*, *Gratiola*, *Puellia*, *Tillandsia*, *Viola* and *Panocratium*, as well as on our native grape-vines, tobacco and pecan-nut. He published also a variety of papers on mammals, reptiles, batrachians and crustacea, mostly of a systematic character, and collected a vast amount of material for the natural history of our insects, as may be seen by a single installment that was published in

Paris in conjunction with Boisduval upon North American butterflies (*Histoire Generale et Iconographie des Lepidopteres et des Chenilles de l'Amerique Septentrionale*). Coleoptera, however, may be said to have been his specialty, particularly in the latter part of his career, though he published only four papers on them, and mainly upon a single family, the Histeridae. He not only amassed a considerable collection, but left behind a most extensive series of water-color illustrations of our native insects and plants made with his own hands." *

He was the father of Dr. John Lawrence LeConte, the distinguished Coleopterist, who died in 1883.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

AN oil portrait of Dr. John Lawrence LeConte, the distinguished American Coleopterist, was presented to the Academy of Natural Sciences of Philadelphia, on Tuesday, April 18, 1911, by Mrs. LeConte. Dr. Henry Skinner made the presentation on her behalf.

A STATE Biological Survey has been organized at the University of Colorado, the work being in the hands of a committee consisting of Professors F. Ramaley, T. D. A. Cockerell and J. Henderson. The work of such a survey has been carried on for a number of years past, but until now there has been no definite organization. The work includes fossil as well as living species of plants and animals.—*Science*.

TAXONOMIC VALUE of the Genital Armature in the Tse-tse flies (*Glossina*).—Mr. Robert Newstead gave an address on this topic to the Lancashire and Cheshire Entomological Society, December 19, 1910, an abstract of which occupies nearly a page each in the *Entomologist* and the *Entomologists' Monthly Magazine* for March, 1911. He finds the male armature to be "the true and almost only natural anatomic elements that can at present be found in these insects." On this basis the eleven species now known fall into three very striking and distinct groups.

*S. H. Scudder, Trans. Amer. Ent. Soc., Vol. XI. (Appendix). The superb collection of Major LeConte's drawings of insects are now the property of the Missouri Botanical Garden, and it is a great pity they have never been published, as they could be splendidly reproduced by the half-tone process.—H. S.

WHAT IS THE GENOTYPE OF *X-US* JONES, 1900, BASED UPON A SPECIES ERRONEOUSLY DETERMINED AS *ALBUS* SMITH, 1890?—*Statement of Case.*—Jones proposes the new genus *X-us*, 1900, type species *albus* Smith, 1890. It later develops that *albus* Smith, 1890, as determined by Jones, 1900, is an erroneous determination. What is the genotype of *X-us*, 1900; *albus* Smith, 1890, or the form erroneously identified by Jones as *albus* in 1900?

Discussion.—The nomenclatorial problem expressed in the caption of this note is solved in two diametrically opposite ways by different authors. Some writers maintain that the original *albus* Smith, 1890, is the genotype, while others maintain that the genotype is represented by the species actually studied by Jones and misdetermined as *albus* Smith. Cases of this general nature have given rise to considerable confusion in nomenclature, and several such cases have been referred to the International Commission on Nomenclature for opinion. At the last meeting of the commission, the principles involved came up for discussion, but it was impossible to reach a unanimous agreement. On account of the differences of opinion, the secretary was instructed to make a careful study of a number of cases, and to report upon the same to the commission. It is not difficult to foresee that no matter how the cases are finally decided, great dissatisfaction will arise among zoologists because the opinion rendered is not the direct opposite of what it eventually will be. Recognizing that this is one of the most difficult cases that has ever been submitted to the commission, and recognizing the fact that regardless of our action we shall probably be criticized more on basis of our decision on this case than because of any other opinion that we have rendered, I am desirous of studying at least one hundred cases if possible, that would come under such ruling, before my report is formulated. In view of the foregoing premises, I respectfully request zoologists in different groups to call my attention to as many instances of this kind as possible, with which they are acquainted in their different specialties. Further, since the arguments on both sides of the problem appear to be almost equally valid, it does not seem impossible that the final decision will have to be based upon an arbitrary choice between the two possible rulings and on this account I am desirous of obtaining all possible arguments on both sides as they occur to different zoologists, and also any personal views based upon convenience or inconvenience, or other grounds, which may be held by different colleagues. I will hold the case open at least until September 1, for the presentation of arguments by any persons who may desire to submit their views.—C. W. STILES, *Secretary of the Commission*. Bureau of Animal Industry, U. S. Dept. Agric., Washington, D. C. (Reprinted from *Science*).

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), excluding Arachnida and Myriapoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in Heavy-Faced Type refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted. This (*) following a record, denotes that the paper in question contains description of a new North American form.

For record of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

- 3—The American Naturalist. 4—The Canadian Entomologist. 7—U. S. Department of Agriculture, Bureau of Entomology. 8—The Entomologist's Monthly Magazine, London. 9—The Entomologist, London. 11—Annals and Magazine of Natural History, London. 19—Horae Societatis Entomologiae Rossicae. 22—Zoologischer Anzeiger, Leipzig. 35—Annales, Societe Entomologique de Belgique. 45—Deutsche Entomologische Zeitschrift. 46—Tijdschrift voor Entomologie. 50—Proceedings, U. S. National Museum. 73—Archives, Zoologie, Experimentale et Generale, serie 5, Paris. 84—Entomologische Rundschau. 89—Zoologische Jahrbucher, Jena. 92—Zeitschrift fur wissenschaftliche Insektenbiologie. 143—Ohio Naturalist. 148—New York Agricultural Experiment Station, Geneva. 163—American Journal of Science, New Haven, Conn. 179—Journal of Economic Entomology. 185—Journal, Quekett Microscopical Club, London. 193—Entomologische Blatter, Nurnberg. 204—New York State Museum Bulletin. 216—Entomologische Zeitschrift, Stuttgart. 220—New Jersey Agricultural Experiment Station, New Brunswick, N. J. 240—Maine Agricultural Experiment Station, Orono. 272—Memorias, Real Academia de Ciencias y Artes de Barcelona. 285—Nature Study Review, Urbana, Illinois. 305—Deutsche Entomologische National-Bibliothek, Berlin. 310—L'Echange, Revue Linneene, Moulins. 326—Le Progress Agricole et Viticole, Villefranche, France. 327—Scientific Memoirs by Officers of the Medical and Sanitary Departments of the Government of India. (new Ser.), Calcutta. 328—Anales del Museo Nacional de Montevideo. 329—Zoologica, Stuttgart. 330—London, Edinburgh and Dublin Philosophical Magazine and Journal of Science, London. 331—Annual Report, Experimental Farms, Canada Department of Agriculture, Ottawa. 332—Bulletin of the Southern California Academy of Sciences, Los Angeles.

GENERAL SUBJECT. Felt, E. P.—26th report of the state entomologist on injurious and other insects of the state of New York, 1910, 204, No. 147, 104 pp. Handlirsch, A.—New paleozoic insects from the vicinity of Mazon Creek, Illinois, (continuation), 163, xxxi, 353-377 (*). Hartzell, F. Z.—A preliminary report on grape insects, 148, Bul. No. 331, 489-581. Hawkins, L. S.—Studies of aquatic insects, 285 vii, 91-96. Hewitt, C. G.—Report of the Entomologist (of Experimental farms of Canada), 331, 1910, 223-250. Johannsen, O. A.—Insect notes for 1910, 240, Bul. No. 187, 1-10. Michelson, A. A.—On metallic coloring in birds and insects, 330, xxi, 554-567. Muller, R.—Die uebertragung von krankheiten durch insekten, (cont.), 216, xxv, 17-19. Murtfeldt, M. E.—Why collect insects? 179, iv, 229-230. Sherborn & Durrant—Note on John Curtis' British Entomology, 1824-39; 1829-40; and 1862, 8, xxii, 84-85. Smith, J. B.—Insects injurious to the peach trees in N. J., 220, Bul. No. 235. Sorauer, P.—Handbuch der pflanzenkrankheiten. Lief. 23, 401-430 pp., Berlin. Wilson, H. F.—Some old methods applied in a new manner to a collecting machine, 179, iv, 286-288. Zweigelt, F.—Das sammeln in der natur und seine wissenschaftliche und psychologische bedeutung (cont.) 84, xxviii, 57-58.

APTERA & NEUROPTERA. Alderson, E. M.—Notes on the life-history of *Chrysopa flava*, 9, xliv, 126-129. Hoffmann, R. W.—Zur kenntnis der entwicklungsgeschichte der Collembolen, 22, xxxvii, 353-377. Krauss, H. A.—Monographie der Embiden, 329, Heft 60, 78 pp. Lewis, R. T.—Note on the larva of *Mantispa*, 185, xi, 213-216. Patch, E. M.—Insect notes for 1910. Psyllidae, 240, Bul. No. 187, 10-20 (*). Schirmer, C.—Libellen-studien, 84, xxviii, 49-50.

ORTHOPTERA. Bruner, L.—Report on an interesting collection of locusts from Peru, 19, xxxix, 464-488. Burr, M.—Vorlaufige revision der Labiiden, 305, ii, 58-61 (n. g.). Caudell, A. N.—Description of a n. sp. of Orthoptera from Texas, 4, xliii, 137-138 (*). Heymons, R.—Ueber die lebensweise von *Hemimerus*, 45, 1911, 163-174. Parrott, P. J.—Oviposition among tree-cricket, 179, iv, 216-218. Zacher, F.—Die schadelbildung einiger Eudermaptera nebst bemerkungen ueber die gattungen *Elaanon* und *Diaperasticus*, 45, 1911, 145-148.

HEMIPTERA. Davis, J. J.—A list of the Aphididae of Illinois, with notes on some of the species, (cont.) 179, iii, 482-499. Distant, W. L.—Rhynchotal notes LIV. Pentatomidae from various regions, 11, vii, 338-354. On some controversial items concerning

a few Rhynchota, 35, iv, 88-89. Herrick, G. W.—The cabbage aphid, *Aphis brassicae*, 179, iv, 219-224. Kershaw, J. C.—Notes on the salivary-glands and syringe of two spp. Hemiptera, 35, iv, 80-83. Lindinger, L.—Beitrage zur Kenntnis der Schildlaus und ihrer Verbreitung, II (cont.), 92, vi, 437-441; vii, 9-12. Lohrenz, H. W.—The woolly Aphis, *Schizoneura lanigera*, 179, iv, 162-170. Murtfeldt, M. E.—Habits of the honeysuckle aphid, *Rhopalosiphum xylostei*, 179, iv, 227-228. Patch, E. M.—Plant lice of the apple in Maine, 240, 11-22. Insect notes for 1910, Aphididae, 240, Bul. No. 187, 20-23. Poppius, B.—Zwei neue nearktische Miriden gattungen, 35, iv, 84-87 (*). Schumacher, F.—Beitrage zur Kenntnis der Biologie der Asopiden (cont.), 92, vi, 430-437.

LEPIDOPTERA. Bethune, C. J. S.—*Smerinthus cerisyi* Kirby, (not *cerysi*), 4, xliii, 132. Busck, A.—Descriptions of tineoid moths from So. America, 50, xl, 205-230. Foster, S. W.—Life history of the codling moth and its control on pears in California, 7, Bull. No. 97, pt. 2, 13-51 pp. Fyles, T. W.—*Gnorimoschema gallaediopappi* and *G. gallaeasterella*, 4, xliii, 135-137. Gerould, J. H.—The inheritance of polymorphism and sex in *Colias philodice*, 3, xlv, 257-283. Gibson, A.—The preparatory stages of *Phragmatobia assimilans*, variety *franconia*, 4, xliii, 125-128. Grinnell, F., Jr.—Notes and additions to the list of Southern California Lepidoptera, 332, x, 12-13. Kopec, S.—Ueber den feineren bau einer zwitterdruse von *Lymantria dispar*, 22, xxxviii, 262-270. Kusnezov, N. J.—On the probable viviparity in some Danaid, i. e., Pierid, butterflies. (Russian, summary in English), 19, xxxix, 634-651. Patch, E. M.—Cut worms in Maine, 240, 23-24. Picard, F.—Les micrilepidopteres de la vigne, *Pyrale*, *Cochylis*, *Eudemis*, 326, xxxii, 448-469. Schaus, W.—New species of Heterocera from Costa Rica, 11, vii, 355-372. Thiele, R.—Die aufzucht der seidenraupen mit schwarzwurzelblattern, 45, 1911, 220-221. Tremoleras, J.—Apuntes lepidopterologicos, 328, i, 89-95. Webster, R. L.—Notes on the wheat-head army worms (*Meliana albilinea*) as a timothy pest, 179, iv, 179-184. Wheeler, G.—The *Athalia* group of the genus *Melitaea*, (cont.), 9, xlv, 10-13. Wildermuth, V. L.—The alfalfa caterpillar (*Eurymus eurytheme*), 7, Circ. No. 133.

DIPTERA. Banks, N.—Four n. sp. of Asilidae, 4, xliii, 128-130 (*). Cunningham, J.—The destruction of fleas by exposure to the sun, 327, No. 40. Dean, W. H.—The sorghum midge (*Contarinia sorghicola*), 7, Bull. No. 85, pt. IV revised. De Meijere, J. C. H.—Ueber in farnen parasitierende Hymenopteren-und Dipteren-larven, 46, liv, 80-127. Felt, E. P.—*Miastor* larvae, 4, xliii, 134-135. Hendel, F.—Die arten der Dipteren-subfamilie *Richardiinae*, 45, 1911,

181-212 (*). **Hine, J. S.**—New species of Diptera of the genus *Erax*, 143, xi, 307-311 (*). **Johannsen, O. A.**—The typhoid fly and its allies, 240, 1-7. **Schnabel, J.**—Ueber die gattungsrechte der gattung *Pegomyia*, 19, xxxix, 105-114. **Schoene, W. J.**—Notes on the life history and habits of *Pegomya brassicae*, 179, iv, 210-216. **Thienemann, A.**—Das sammeln von puppenhäuten der Chironomiden, 45, 1911, 161-162.

COLEOPTERA. **Arrow, G. J.**—On lamellicorn beetles belonging to the subfamilies Ochodaeinae, Orphninae, Hybosorinae, and Troginae; 11, vii, 390-397 (*). **Bofill y Pichot, J. M.**—Algunos datos analomicos y biologicos del *Anthrenus verbasci*, 272, viii, No. 26, 11 pp. **Britten, H.**—Coleoptera from underground wasps' nests, 8, xxii, 89-90. **Chittenden, F. H.**—The broad-nosed grain weevil (*Caulophilus latinastus*) and the long-headed flour beetle (*Latheticus oryzae*), 7, Bull. No. 96 pt. 2. The lesser and larger grain-borer (*Rhizopertha dominica* and *Dinoderus truncatus*), 7, Bull. No. 96 pt. 3. **Felsche, C.**—Coprophage Scarabaeiden, 45, 1911, 133-141. **Franck, P.**—Ueber einen argentinischen rüsselkafer, der im wasser schwimmen kann, 45, 1911, 141-144. **Gahan, C. J.**—On some recent attempts to classify the Coleoptera in accordance with their phylogeny, 9, xlv, 121-125. **Gebien, H.**—Die gattung *Phrenapates*, 45, 1911, 149-161. *Coleopterorum catalogus*, Paris. 28: Tenebrionidae III, 357-585 pp. **Hinds & Turner**—Life history of the rice weevil (*Calandra arya*) in Alabama, 179, iv, 230-236. **Holdhaus, K.**—Die Oekologie und die Sammeltechnik der terricolen Coleopteren, 193, vii, 6-9, 47-55, 76-86. **Kelly, E. O. G.**—The maize bill-bug (*Sphenophorus maidis*), 7, Bul. No. 95 pt. 2. **McDermott & Crane**—A comparative study of the structure of the photogenic organs of certain American Lampyridae, 3, xlv, 306-313. **Morris, F. J. A.**—Beetles found about foliage, 4, xliii, 109-118. **Nusslin, O.**—Phylogenie und system der Borkenkafer, (cont.), 92, vii, 1-5. **Philips, W. J.**—The timothy stem-borer, a new timothy insect. (*Mordellistena ustulata*), 7, Bull. No. 95, pt. 1, 9 pp. **Pic, M.**—Coleopteres exotiques nouveaux ou peu connus, (cont.), 310, 1910, 5-7, 12-14, 20-22, 28-30, 36-37, 45-47, 53-54, 60-63, 69-71, 74-78, 86-87, 94-95. **Webster, F. M.**—The lesser clover-leaf weevil (*Phytonomus nigrirostris*), 7, Bull. No. 85, pt. 1. The alfalfa weevil (*Phytonomus murinus*), 7, Circ. No. 137.

HYMENOPTERA. **Bradley, J. C.**—A new Thynnid wasp from Brazil, 45, 1911, 131-132. **Brauns, H.**—Biologisches ueber sudafrikanische Hymenopteren, (cont.), 92, vi, 445-447; vii, 16-19. **Cockereil, T. D. A.**—Some new bees from flowers of Cactaceae, 4, xliii, 131-132 (*). Bees in the collection of the U. S. Nat. Museum, 2,

50, xl, 241-264 (*). **De Meijere, J. C. H.**—Ueber in farnen parasitierende Hymenopteren-und Dipteren-larven, 46, liv, 80-127. **Girault, A. A.**—An egg-parasite of the codling moth belonging to the family Mymaridae, 4, xliii, 133-134. **Howard, L. O.**—A n. sp. of *Coccophagus*, with a table of the host relations of those species of the genus known to the writer, 179, iv, 276-277 (*). **Kaye, W. J.**—New species of Syntomidae from Br. Guiana and So. Brazil, 9, xlv, 142-146. **Popovici-Bazosanu, A.**—Contribution a l'etude biologique des sphegiens (*Trypoxylon* et *Psenulus*), 73, vi, xciii-ciii. **Rohwer, S. A.**—Notes on Tenthredinoidea, with descriptions of n. sp. Paper XIII, Miscellaneous notes, 4, xliii, 119-123. **Rudow, Dr.**—Afterraupen der blattwespen und ihre entwicklung, (cont.), 84, xxviii, 53-54, 61-62. **Schon, A.**—Bau und entwicklung des tibialen chordotonalorgans bei der honigbiene und bei ameisen, 89, xxxl, 439-472. **Turner, R. E.**—Notes on Fossorial Hymenoptera III, 11, vii, 297-310. **Viereck, H. L.**—Descriptions of six n. g. and thirty-one n. sp. of Ichneumon flies, 50, lx, 173-196 (*).

LIST OF NORTH AMERICAN CICINDELIDAE IN THE HARRIS COLLECTION.

By Edward Doubleday Harris, Truan Press, Yonkers, New York, 1911.

The advent of the printed pin-locality-label marked a distinct advance in the study of entomology, as many interesting problems will be solved by a study of geographical distribution and seasonal appearance. Mr. Harris has given the student of distribution a useful guide and has made his splendid collection of these beetles of use to the scientific world. There are too many collections that are only a source of pleasure to the owners and contain a large amount of valuable data that may or may not become of use. The genus *Cicindela* is a very interesting one from the standpoint of evolution and illustrates the words of LeConte spoken many years ago: "The prevailing character of tropical faunas is individuality, the production of peculiar forms within limited regions, while the distinguishing feature of temperate and Arctic faunas is the repetition of similar or identical forms through extensive localities." The Coleopterists have been prone to poke fun at the Lepidopterists, alleging lack of anatomical characters in descriptive work, and undue reliance on color. A careful study of specific values in the Cicindelidae will show some surprising things, and I am afraid, in some instances, the best method of determining species is to rely on the locality label. This work by Mr. Harris will be found very useful to the systematist, and the student of distribution and geographical variation.—H. S.

ILLUSTRATIONS OF DIURNAL LEPIDOPTERA with Descriptions. By Andrew Gray Weeks, Jr. Second volume. University Press, Cambridge, Mass. This work contains twenty-one beautiful and accurate illustrations of new species lithographed in color. The species were taken in the neighborhood of the Suapure River in Venezuela. Mr. Weeks is to be congratulated on this excellent work as it is a valuable contribution to the literature of exotic Rhopalocera. The frontispiece is an engraved portrait of the late distinguished student of the butterflies, Mr. William Henry Edwards. There is given a list of the writings of Mr. Edwards and a list of the species received from Suapure. We hope to see additional volumes by Mr. Weeks. If all new species were illustrated in this way the study would be relieved of many difficulties.

It may be well in this connection to call attention to the joint work "Illustrations of North American Lepidoptera Sphingidae," by J. W. Weidemeyer, S. Calverley and W. H. Edwards, published by the American Entomological Society in 1903.—H. S.

A HISTORY OF THE AMERICAN ENTOMOLOGICAL SOCIETY, PHILADELPHIA, 1859-1909. Prepared by request of the Society by E. T. Cresson with an introduction by the Rev. Henry C. McCook, D.D., Philadelphia, Pa.—This pamphlet of sixty pages has been issued by the society whose name and seal it bears on the title-page as a result of the meeting held February 15, 1909, in commemoration of its fiftieth anniversary. At that meeting, Mr. E. T. Cresson, sole survivor of the three founders of the Entomological Society of Philadelphia, read a history of the earlier years of its existence and then moved that a Committee be appointed to bring the history up-to-date. This action having been decided on, Rev. Dr. Henry C. McCook, Mr. Benjamin H. Smith and Dr. Henry Skinner were charged with this duty, and the present pamphlet is the result of their labors. Its contents are: an Introduction by Dr. McCook, the history of the Society, 1859-1909 (18 pages), the proceedings of the fiftieth anniversary meeting, statements of the contents of the Society's collections of insects and library, lists of the names and terms of officers, a list of the past and present resident and corresponding members, and a copy of the act of incorporation of the Entomological Society of Philadelphia by the Legislature of Pennsylvania in 1862. (By action of the Court, this charter was on petition amended in 1867, and the Society's name changed to "The American Entomological Society"). The pamphlet is illustrated by three portraits—those of Dr. Thomas B. Wilson, (died March 15, 1865), its early and greatest benefactor; Dr. John L. LeConte (president 1859-60, 1870-83), and Dr. George H. Horn (president 1867-68, 1884-97).

Doings of Societies.

FELDMAN COLLECTING SOCIAL.

Meeting of February 15th, 1911, at 1523 S. 13th St., Philadelphia. Twelve members were present. President Haimbach in the chair.

Prof. Smith read a very interesting article entitled "Entomology—the Old and the New," contrasting the older and younger generations. This led to a general discussion on collectors and the lack of knowledge displayed by the majority of these.

Mr. Daecke recorded the following species of Diptera which did not appear in the latest New Jersey List: *Diachlorus ferrugatus* Fabr., "The Yellow Fly of the Dismal Swamp," collected by himself at Weymouth, VII-30-'04 and Stone Harbor VIII-3-'07.

Mr. Harbeck exhibited five species of Tachinidæ, showing their extremes in size and mentioning their hosts; they were: *Archytas aterrima* Desv., *Winthemia quadripustulata* Fabr., *Senotainia trilineata* V. d W., *Cryptomeigenia thentis* Walker and *Cistogaster immaculata* Macq.

A vote of thanks was extended to Mr. Haimbach for the manner in which he entertained the Social in January.

Adjourned to the annex.

Meeting of March 15th, 1911, at 1523 S. 13th St., Philadelphia. Eight members were present. Vice-President Wenzel in the chair.

Mr. Laurent mentioned the different broods of the Periodical Cicada, and said that they could be easily traced, but it was hard to understand their overlapping. The same speaker also made some remarks regarding the collecting of Lepidoptera while away on a long trip, stating that all specimens of one inch or less expanse should be pinned with the wings hanging downwards, as such specimens were easily relaxed and good mounts could be made. This was particularly the case with the butterflies of the genus *Pamphila*, as where the specimens

had been papered it was almost impossible to make a good and perfect mount. The pin in the field should be two sizes smaller than the one finally used for the collection. This led to a general discussion on the different modes of mounting other orders.

Mr. Wenzel exhibited several boxes of his recently remounted and re-arranged weevils.

Adjourned to the annex.—GEO. M. GREENE, *Secretary*.

NEWARK ENTOMOLOGICAL SOCIETY.

The regular meeting that was to be held on February 12, 1911, at the Newark Turn Hall was dispensed with, and instead the following fifteen members Angelman, Brehme, Broadwell, Buenson, Doerfel, Doll, Erhard, Franck, Keller, Lemmer, McCormack, Mayfield, Porter, Schmich and Schleckser, on the invitation of Mr. Kearfott, visited him at his residence in Montclair. Mr. Kearfott invited the "boys" to look at his collection of Micro-lepidoptera which contains about 150,000 specimens, and which without doubt is one of the largest of its kind in the world.

Several hours were spent in looking over the tiny insects, and then Mr. Kearfott invited the visitors to take lunch and refreshments. The members appreciated the hospitality very much and a vote of thanks was tendered to Mr. Kearfott.

Meeting of March 12th, 1911, at the Newark Turn Hall. President Buchholz in the chair; eleven members present, Mr. H. Kircher and H. Schwandke, visitors.

Mr. Herpers presented the Society with a set of the Bulletin of the Brooklyn Entomological Society, Volumes 1-2-3 and 5, and also a copy of Explanation of Terms used in Entomology, published by the Brooklyn Entomological Society in 1883. A series of seventeen year locusts, collected by Mr. Herpers in 1894, were donated to the Society's collection.

Mr. Kircher reported finding a *Ceratomia undulosa* caterpillar feeding on Trumpet Vine.

Meeting of April 9th, 1911, at Newark Turn Hall. President Buchholz in the chair; twelve members present.

On the motion of Mr. Keller to hold a field meeting on May 30th, the President appointed Messrs. Keller, Brehme and Erhard as a committee to select a suitable place for the meeting. The Field Committee selected Springfield, New Jersey, for this meeting.

Mr. Keller reported that he had seen the Starlings (*Sturnus vulgaris*) picking the soft Arctia cocoons from sides of houses.

A general discussion on Forestry and Collecting in the United States and Germany by Messrs. Keller, Kircher and Buchholz was very interesting. The general belief was that more collecting is done by beating trees in Germany than in the United States.—HERMAN H. BREHME, *Secretary*.

OBITUARY

DR. HERMAN WILLEM VAN DER WEELE.

From a memorial notice (in Dutch) contributed to the latest issue (Volume 54, first Aflevering, April 8, 1911) of the *Tijdschrift voor Entomologie* by Dr. Ed. Everts, we learn some particulars of the life of this young Dutch neuropterist. Van der Weele was born October 8, 1879. His education was obtained at the Leyden High School, especially under Prof. A. C. K. Hoffman, and later at the University of Berne, Switzerland, at which latter, under Prof. W. Studer's direction, he produced his dissertation *Morphologie und Entwicklung der Gonapophysen der Odonaten* and obtained his doctor's degree. He became second conservator of insects at the Leyden Museum of Natural History, and went thence to the Dutch East Indies where he succumbed to cholera in Batavia, Java, August 29, 1910. His bibliography comprises twenty-seven titles of papers in English, French and German, the most extensive among them being two fascicules, on Ascalaphides, Sialides and Rhaphidides, of the *Catalogue Systematique et descriptif*

des collection zoologiques du Baron Edm. de Selys Longchamps. The memorial notice is accompanied by a portrait of van der Weele.

DR. EDOUARD PIAGET.

The same number of the *Tijdschrift* contains also a biographical notice (in Dutch) of Dr. E. Piaget, with two portraits at different periods of his life, by Dr. H. J. Veth. Dr. Piaget was born November 3, 1817, at Les Bayards, canton of Neuchâtel, Switzerland. He went to Holland about the age of eighteen, and studied law at the University of Leyden, intending to return to Switzerland as an advocate. He remained in Holland, however, until 1882, much of the time as lector in the Erasmian Gymnasium and in the Higher Burgerschool, at Rotterdam. Returning to his native land, he remained there until his death in the hospital at Couvet, September 10, 1910. He was interested in Botany and Entomology, in the latter being chiefly known for his work on the Pediculina, his principal memoir being *Les Pediculines, Essai Monographique* (Leide. E. J. Brill, 1880, pp. xxxix, 714, and atlas of 54 plates) with a *Supplement* thereto in 1885 (pp. xii, 162, 17 plates). His entomological papers date from 1869 to 1895. His entomological collection, herbarium and library were presented to the city of Neuchâtel in 1905. He was also the author of a history of the Jesuit order.

DR. SAMUEL HUBBARD SCUDDER.

The daily newspapers announce the death of this veteran entomologist and paleontologist at his home in Cambridge, Massachusetts, on May 17, 1911. We hope to publish a notice of his life and work in the next number of the NEWS.

ERRATUM.

Lines 14 to 17, page 227, of ENTOMOLOGICAL NEWS for May, 1911, should be transferred to the note on "*Platypssylla castoris* Rits. in California" at the top of the same page.



SAMUEL HUBBARD SCUDDER.

ENTOMOLOGICAL NEWS

AND
PROCEEDINGS OF THE ENTOMOLOGICAL SECTION
ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXII.

JULY, 1911.

No. 7.

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Samuel Hubbard Scudder.

(Portrait, Plate VIII)

This distinguished American entomologist died May 17th, 1911, aged seventy-four years. He was born in Boston, Mass., April 13th, 1837, and lived in Cambridge, at 156 Brattle Street. He was educated at Williams College and received honorary degrees from Harvard and the University of Pittsburgh. From 1864 to 1870 he was Custodian of the Boston Society of Natural History, and from 1870 to 1882 Assistant Librarian at Harvard University. From 1886 to 1892 he was Paleontologist to the U. S. Geological Survey; he served as General Secretary of the American Association for the Advancement of Science in 1875, and was a Vice President of the Association in 1894.

He was the greatest Orthopterist America has produced. His first paper on recent Orthoptera, in 1861, in the Proceedings of the Boston Society of Natural History, volume VIII, was "On the genus *Raphidophora*, Serville," etc.; his last on recent Orthoptera was published in April, 1902, in conjunction with Professor T. D. A. Cockerell, entitled "A first list

of the Orthoptera of New Mexico" in Proceedings of the Davenport Academy of Sciences, volume IX.

The total number of his writings on North American Orthoptera is 131, and his work was chiefly upon the North American forms of the order, but over one hundred exotic species also were described by him.

The most noteworthy of these North American papers were the following:

Entomological Notes, which ran in the Proceedings of the Boston Society of Natural History, volumes XI to XIX, (1868-78) and treated of Lepidoptera as well as Orthoptera.

A Century of Orthoptera, Decades I-X, in the same Proceedings, volumes XII-XX, (1868-79). Some of these appeared also as portions of the *Entomological Notes* series.

Catalogue of the Orthoptera of North America described previous to 1867. Washington, 1868.

Various papers based on the collections made by Packard, Hayden, Wheeler and others in the government survey and expedition work of the '60's and '70's.

Guide to the Genera and Classification of the North American Orthoptera found North of Mexico. Cambridge, 1897.

Revision of the Orthopteran Group Melanopli, Wash., 1897.

Catalogue of the Described Orthoptera of the United States and Canada. Davenport, 1900.

Alphabetical Index to North American Orthoptera described in the eighteenth and nineteenth centuries. Boston, 1901.

His work on the Orthoptera may be summed up by saying that it was the basis on which the present classification of North American Orthoptera was developed.

J. A. G. R.

Dr. Scudder began writing on the diurnal lepidoptera about fifty years ago, and contributed very largely to the literature of the subject. His papers are to be found in most of the

entomological journals of the country, and also in the most of the publications of the learned societies of New England. He described a goodly number of our butterflies, and the students of the future will often think of him in connection with such interesting species as *Argynnis montinus*, *Melitaea harrisii*, *Anaca andria*, *Cotias interior*, *Pamphila metea*, *mystic*, *manataqua*, *panoquin*, *hianna*, *Amblyscirtes samoset*, *Pyrgus tessellata*, *Thanaos martialis*, etc. He described about thirty species of butterflies found in the United States. His writings cover practically all phases of the subject and show marked originality; they number about one hundred papers and some valuable books and memoirs, the work entailing the greatest amount of labor, and research being his *Butterflies of the Eastern United States and Canada, with special reference to New England*, in three volumes, Cambridge, 1889, (published by the author). This is a mine of information, from all sources, and will be invaluable for many years to come. Special attention was given to the distribution, habits, and life-histories and careful descriptions of the various stages of life. An important feature is the mention of the "desiderata" or the gaps in our knowledge of the species in any particular.

Other works are as follows: *The Life of a Butterfly* (*Anosia plexippus*) (1893); *Butterflies: Their Structure, Changes and Life Histories, with Special Reference to American Forms*, (1881); *A Brief Guide to the Commoner Butterflies of the United States*, (1893); *Fossil Butterflies*; *Historical Sketch of the Generic Names Proposed for Butterflies*; *Frail Children of the Air* (1895); *Every-Day Butterflies, A Group of Biographies* (1899); *Entomological Correspondence of Thaddeus William Harris*.

He was for many years the editor of *Psyche*, the organ of the Cambridge Entomological Club, and contributed largely to its pages, and was Editor of *Science*, 1883-1885. Another invaluable work and one that entailed an immense amount of

labor was the compilation of *The Nomenclator Zoologicus* or *Universal Index to the Genera in Zoology* (1882). In 1890 appeared *The Tertiary Insects of North America*, a work of 663 pages and 28 plates. Mr. Scudder was the foremost student of fossil insects in America, and in addition to this large work wrote other important papers in this branch of study, such as the section on fossil Myriopods, Arachnoids and Insects in Zittel's great *Handbuch der Paleontologie* (1885, English translation 1900). He contributed largely to our knowledge of the fauna of the New England States, and particularly of the White Mountains of New Hampshire. His studies in classification were largely accepted the world over. In conjunction with Edward Burgess he was a pioneer in the study of the genitalia of the butterflies; on antigeny or sexual dimorphism, on androconia and other parts of the minute anatomy, he did important work. In a brief notice it is impossible to even mention all his activities.

He was perhaps the greatest scholar and man of the greatest literary ability among the entomologists that America has produced. His biography of John Lawrence LeConte well illustrates this ability and his painstaking care in research. He was a man of culture, refinement and gentlemanly instincts, and in his home was hospitable and kindly to all that came to seek knowledge and consult the wealth of material in his collection. He added great lustre to the study of entomology in America, and his high abilities were recognized with honorary or corresponding membership by leading scientific societies of the Old World.—H. S.

THE PUGET SOUND MARINE STATION established by the University of Washington at Friday Harbor, Washington, in the summer of 1904, and since 1908 placed upon a co-operative basis, (practically all of the educational institutions of the Northwest participating in the organization), will this year offer courses in Botany and Zoology, from June 26 to August 3, opportunities for research, etc. For information apply to Professor Trevor Kincaid, University of Washington, Seattle, Wash.

Thecla clytie, leda and ines (Lepid.).

By J. R. HASKIN, Los Angeles, Cal., and F. GRINNELL, JR.

In May and June, 1908, Mr. Grinnell took twenty specimens of a small *Thecla* near Dos Palmos Spring, in the Santa Rosa Mountains, southern California, at an elevation of 3500 feet. In July, 1910, Mr. Haskin took seven specimens of the same species at Cananea, Mexico, thirty miles south of the American border, at 5000 feet elevation. In June, 1908, Mr. V. L. Clemence collected a number in the Chiricahua Mountains, of southern Arizona. In June and July, 1910, Messrs. Coolidge and Clemence collected others in the Huachuca Mountains, of southern Arizona, at about 5000 feet elevation.

Mr. W. G. Wright, in his Butterflies of the West Coast, figures the same species as *Thecla ines* from specimens taken in the Santa Rita Mountains, of Arizona and southern California, in October, 1892-3. Dr. Holland figures the same as *Thecla clytie*, Plate XXX, fig. 6, ♀. This we presume is from the Edwards unique type specimen. Again in *Thecla ines*, Plate XXIX, fig. 35, ♂, we find the same species. Mr. W. S. Wright, in the Journal of the New York Entomological Society, XVI, Sept., 1908, P. 162, mentions *Thecla ines* as taken by Mr. G. H. Field in July, at Jacumba, San Diego County, California. He supposes there are two broods, one in July and the other in October.

An attempt by us to name correctly our specimens, together with others taken by Mr. Clemence, has led us to the conclusion that *clytie*, *leda* and *ines* are one and the same butterfly. We first made use of Holland's Butterfly Book and found that the *ines* description and figures most nearly approached our specimens. All of ours, however, are very distinctly marked with a line clear across both wings in which bright red is predominant. The details of this line are given in the description which follows. In a general way we can describe it by saying that it is like the extra-discal line on *Thecla melinus* with which all collectors are familiar. In fact, our specimens on the under side look very much like diminutive, pale-gray *melinus*.

COMPARISON OF DESCRIPTIONS OF *T. LEDA*, *T. CLYTIE*, AND *T. INES* WITH OUR SPECIMENS.

<i>T. leda.</i>	<i>T. clytie.</i>	<i>T. ines.</i>	Specimens cited.
Described from 2 ♂ taken near Prescott, Ariz. Expanse, .85 inch.	Described from 1 ♀ taken at San Antonio, Texas. Expanse, .8 inch.	Described from a large number of examples taken in Southern Arizona. October. ♂.—Expanse, .8 to .85 inch. ♀.—Expanse, about 1 inch.	Specimens taken at Cananea, Mexico; Chiricahua Mts. and Huachuca Mts., Southern Arizona; and Santa Rosa Mts., Southern California, in June and July. Expanse .75-.85 inch.
Upper side pale black. [Pale black is good!]	Upper side of primaries is blackish.	♂.—The apical area of primaries . . . is brown-black. ♀.—Rather more than half of primaries is black.	Black in fresh specimens; worn specimens rusty black.
Along inner margin of primaries and base, and inner half of secondaries, violet-blue.	On the inner margins (of primary) up to cell . . . the color is light blue, forming a pretty regular arc of a circle, terminating at three-fourths the distance from base to inner angle. Secondaries wholly light blue, color of <i>Lycæna pseudargiolus</i> , pale next outer angle, and along inner margin.	♂.—Upper side wholly lavender blue, except the apical area of primaries. ♀.—The blue being restricted to posterior part and not reaching inner angle; the blue is also a shade darker than in the male; secondaries blue, except on the costal margin, which is black.	If a coin or round disk a trifle over .5 inch in diameter be placed over the spread ♀ butterfly so that the head barely projects from the edge, the visible portion of the wings is black and the concealed portion light blue. The outer angle of secondaries is in the black area. The ♂ is like the description of <i>leda</i> ♂. The ♀ is like <i>clytie</i> ♀. If whoever has the original specimens of <i>ines</i> will examine them carefully we suspect he will find that Mr. Edwards has mixed up his ♂ and ♀. In a fresh ♂ specimen the <i>Thecla</i> stigma on cell of primary can readily be seen. This is not mentioned in <i>ines</i> .

<i>T. leda.</i>	<i>T. clytie.</i>	<i>T. ines.</i>	<i>Specimens cited.</i>
<p>♂.—On primaries a dark, rough stigma; secondaries have two tails, the anterior one short, the other long, both black with white tips; a dark patch at anal angle, and two in the next adjoining interspaces on the margin.</p>	<p>♀.—Hind margin secondaries edged with a black line, preceded by a white one, and on that towards outer angle is a narrow fulvous edging, some small patches of fuscous also near the inner angle along same line; in lower median interspace is a marginal black, rounded spot, and at inner angle an orange spot; furnished with two tails, the outer one short, white; the inner one very long, thread-like, black, partly fringed on one side by white, white at tip; fringes of primaries fuscous, of secondaries white, not pure but a little gray, and at the ends of middle nervules darker than elsewhere.</p>	<p>Secondaries have a rounded, black marginal spot between the tails and an indistinct spot next anal angle; the posterior tail is long, and both are slender, black, tipped white, fringes sordid white next the margin, brown at ends.</p>	<p>Each detail of <i>leda</i> tallies with our ♂. Each detail of <i>ines</i> tallies with our ♀. Each detail of the minutely described <i>clytie</i> can be seen on our ♀ in bright day light and with a low-power glass, except that the orange spot at inner angle is represented by a distinct trace only of orange, and the minute anterior tail is not wholly white.</p>
<p>Under side gray-brown.</p>	<p>Under side gray-white, pale on disks and darkest on hind margins.</p>	<p>Under side of both wings cinereous, lightest colored over extradiscal part of secondaries. Under a glass the scales are seen to be alternately gray and brown.</p>	<p>Under side.—The average specimen is of an almost uniform light gray showing a tint of brownish when held in certain lights. Our most strongly marked ♂ follows <i>ines</i> exactly.</p>

<i>T. leda.</i>	<i>T. chlytie.</i>	<i>T. ines.</i>	<i>Specimens cited.</i>
Both wings edged by a brown line, next which the scales are whiter than elsewhere, giving the appearance of a second line, white.	Both wings are edged with a fine red line.	No detail given.	Ours follow <i>leda</i> exactly. The line in <i>chlytie</i> is red and will be mentioned again in our conclusion.
Primaries have an obscure sub-marginal series of brown lunules.	Primaries also have a sub-marginal row of pale fuscous, sub-lunate spots.	Primaries have a submarginal line of pale brown lunules.	The reader may choose any of the preceding descriptions, and consider it as applying to our specimens.
An extra discal, somewhat macular, band covering whole wing, brown, with no scales, and edged without by white.	Crossed a little beyond the middle by a common series of elongated red spots edged with white; this series on primaries stops at lower branch of median.	An extra-discal, nearly straight black stripe, edged on the outer side by white.	Crossed a little beyond the middle by an irregular red line, edged outwardly by white from which it is separated by a fine black line. This line thins out and disappears at lower branch of median.
At the end of cell a brown bar with red scales and white on either side.	Discal spot of primaries a long red bar.	A straight black bar on arc.	A dark bar at end of cell, with a tendency to red on some specimens.
Secondaries have a clouded, marginal border, indistinct brown lunules, running through a whitish ground.	The marginal area of secondaries is clouded with light and dark, not forming distinct spots.	On secondaries, beyond disk, the gray scales prevail, and this area is clouded, light and dark.	On secondaries a very indistinct line of dark, marginal crescents bordered by gray of a lighter shade than the ground color.
A black anal patch, over which is a red edging, red also on the inner margin just above; and	Between the tails a black triangle upon a large orange spot, and at the angle a black spot	A brown patch at inner angle and a faint spot between the tails.	A black anal spot, over which is a red edging; red on the inner margin also, in some speci-

<i>T. leda.</i>	<i>T. clytie.</i>	<i>T. tues.</i>	<i>Specimens cited.</i>
<p>a rounded red spot, with black at the margin, between the two lower branches of median.</p> <p>Across the disk a macular band from margin to margin, bent at a double angle, or W, below median, brown much covered with red, and edged outside by white.</p> <p>An obscure streak at end of cell and a brown and red bar above cell, half way between band and base.</p>	<p>overtopped by orange; the under side of the tail is also red next the margin.</p> <p>Crossed a little beyond the middle by a common series of elongated red spots, edged with white . . . on inner margin of secondaries takes the form of W.</p> <p>On secondaries there is a small red spot on costal margin near base, and two smaller ones in line with it on middle of basal area.</p>	<p>Secondaries have an irregular black line across disk, forming a W near inner margin. ♀—In the mesial band of secondaries ferruginous scales appear.</p> <p>On the arc a black streak.</p>	<p>mens; between the tails a large orange spot with a small black spot contained in it, not centered but close to outer edge.</p> <p>The discal and limbal areas are separated by an irregular line from margin to margin, bent at a double angle or W below median. This line is bright red bordered outwardly with white from which it is separated by a fine dark line.</p> <p>An obscure streak at end of cell; in some specimens a faint trace of reddish appears; a small elongated red spot, bordered inwardly with white, on costal margin near base; and two similar but smaller and less distinct ones in line with it on middle of basal area.</p>

The figure of *clytie* attracted our attention but the description was meagre and unsatisfactory. *Lacta*'s description mentioned red on the under side, but the figure showed a different species. Edwards' description of *lacta* in Butterflies, 1, 141, Plate 47, proved that we did not have *lacta*.

We next turned to Papilio, Vol. 2, pages 23-4-5, where we found W. H. Edwards' original descriptions of *Thecla leda*, *clytie* and *ines*, *clytie* being reprinted from Field and Forest, Vol 3, page 232, 1877. A very close reading of these descriptions showed, that while our specimens most nearly resembled *leda*, still there was really less difference outlined in the three descriptions than could be found in a good series of *T. melinus* from one locality. They seem to be three different word pictures of the same object. In *clytie* Mr. Edwards polished off his description with great detail, and evidently made considerable use of a low power microscope.

Leda was well finished but not quite so much attention was paid to detail. *Ines* was treated quite crudely, as compared with the others. Again the various details were not described in the same order in any two of the three descriptions and this, with the use of different words for the same things, gives the reader a first impression of a very different species. We have rearranged the order of the details, omitting nothing in any of them, however, and then compared them with our specimens. The results are given above and we believe will be of interest to other students.

Concerning the body, legs, palpi, etc., these insects are so minute that a magnifying glass is required to follow the descriptions. We find that most of the specimens, having been dried and relaxed for spreading, have suffered a loss of freshness. We feel that minute descriptions of one or two specimens under these conditions are of no value, and we therefore omit them. As nearly as we can gather from our best specimens the description should conclude as follows:

Body above covered with blue scales and hair; abdomen above white with a slight amount of light orange. Beneath white with a yellowish tinge on abdomen. Legs generally

white, palpi white, antennae annulated black and white, club black tipped with ferruginous.

Conclusion—A careful comparison of these descriptions will show that the specimens described had only such minute differences as could be expected from different sections and different seasons. In fact there is as much or more difference between our description and the others as there is between them. If they are all legitimate we would be justified in giving still another name to our set of specimens.

We might conclude to call this butterfly *leda*, the description of which most nearly approaches our specimens, with a lowland form *clytie* and a fall form *ines*. This, to our minds would be as justifiable as Edwards' fine differentiation of the eastern *pseudargiolus* forms. *Clytie* has apparently a distinct orange spot on anal angle, while our specimens show only a minute orange patch in the best. In *clytie* the thread-like line along under edge of wings is red, while in ours it is brown. And finally *clytie* has an almost microscopic wholly white anterior tail as against our black tipped with white. *Ines*, on the other hand, is not so fully colored as our specimens. The red of the extra-discal line on under side disappears except for some ferruginous scales on certain specimens. Other minute color details also seem to be subdued as might easily occur in fall specimens. These differences, however, are really so minute that we consider even form names a superfluity.

Thecla clytie was described in 1877. *Leda* and *ines* were described in 1882. Mr. Aaron has stated that *clytie* might possibly be *adria* Hewitson. Until this is demonstrated by some one, we believe that the synonymy of this butterfly is:

Thecla clytie Edwards.

Syn. *leda* Edwards.

Syn. *ines* Edwards.

ERISTALIS OESTRACEUS L. a North American insect.—Mr. E. E. Austen finds that *E. (Syrphus) oestriiformis* Walker, described from the Albany River, Ontario, is a synonym of Linnaeus' *oestraceus*. (Ent. Mo. Mag., March, 1911, pp. 63-64).

A new Variety of *Megathymus yuccae* (Lepid.).

By HENRY SKINNER, M.D., Philadelphia, Pa.

Megathymus navajo n. var.

The specimens appear to be all males. They are black in color, while all the specimens of *yuccae* I have seen are chestnut brown. They range in size 40, 45, 47 and 50 mm. in expanse respectively. The specimens of *yuccae* in our collection range in size from 62 to 68 mm. This variety is similar to *coloradensis* Riley, but is quite different in color. The specimens were sent to me by Mr. W. C. Wood of New York, along with a lot of specimens of *Megathymus streckeri* Skinner, and at first I took the four small, black specimens of *navajo* to be males of *streckeri* as they are the same color (black). They came from Fort Wingate, New Mexico and were taken May 13th, 25th, 31st and June 13th. One specimen's label says "on mountain back of Fort."

The name *navajo* was suggested by Mr. Wood. The butterfly comes from the home of these Indians.

The specimens of *streckeri* were taken on various dates through the month of June and make a new record for the species.

Yuccae and its two varieties may be distinguished from the other species of the genus by the distinct triangular white spot below the centre of the costa on the under-side of the secondary wings.

A new *Datana* (Lepid.).

By JACOB DOLL, Brooklyn, N. Y.

Datana neomexicana n. sp.

Very near *Datana integerrima* var. *cochise* Dyar in coloration but differs in having the fore wings of almost uniform pale gray color, sprinkled more distinctly with small, dark punctures; the costal shade rather feebly contrasted and of pale ochreous color; distal spot obsolete; the lines as usual; the oblique dash near apex obsolete; the form of fore wings as in *Datana californica* Dyar.

Habitat—New Mexico.

Type—One pair in the collection of the Museum of the Brooklyn Institute; cotype, one pair in my collection.

This species is very distinct from *D. integerrima* var. *cochise* Dyar, which it resembles at first sight more than any other *Datana*, by the characters given above which are constant in the specimens I have seen through the kindness of Messrs. Brehme and Erb.

Four new Gall Midges (Dipt.).

By E. P. FELT, Albany, N. Y.

The four species described below, including the representative of a new genus, were reared by Mr. W. H. Patterson, St. Vincent, W. I. Our knowledge of the gall midges of Tropical America is exceedingly fragmentary. Careful collecting and rearing would result in the finding of numerous unknown forms, some of which would doubtless throw much light upon taxonomic questions.

Asphondylia pattersoni n. sp.

This reddish brown midge was reared February 3, 1911, from the flowers of fiddlewood, *Citharexylum quadrangulare*.

Male.—Length, 1.75 mm. Antennae distinctly longer than the body, sparsely haired, light brown; 14 segments, the fifth cylindric, with a length five times its diameter; terminal segment wanting. Palpi: first segment subquadrate, the second with a length three times its diameter, somewhat expanded distally, the third fusiform, slightly curved, as long as the second. Mesonotum reddish-brown, the submedian lines an obscure yellowish. Scutellum yellowish brown, postscutellum fuscous yellowish. Abdomen rather thickly haired, yellowish brown, the basal segments darker, the genitalia slightly darker than the apex of the abdomen. Wings hyaline, costa light brown, the third vein uniting with the margin at the apex of the wing. Femora and tibiae mostly dark brown; claws moderately stout, strongly curved, simple, the pulvilli a little shorter than the claws. Genitalia: basal clasp segment greatly swollen, stout; terminal clasp segment short, greatly swollen, bidentate apically; dorsal plate divided, the lobes orbicular, sparsely setose. Other organs indistinct.

Female.—Length 1.75 mm. Antennae a little shorter than the body, sparsely haired, light brown; 14 segments, the fifth cylindric, with a length about five times its diameter; the thirteenth segment subquadrate, the fourteenth subglobose. Palpi: first segment short, subquadrate, the second subglobose, the third with a length four times its diameter and somewhat dilated. Ovipositor, when extended, about as long as the abdomen, the aciculate portion moderately stout; dorsal pouch apparently represented by an indistinct, thickly setose lobe hardly comparable with the highly developed organ observable in most species of *Asphondylia*.

Type.—Cecid a2132, N. Y. State Museum.

TOXOMYIA n. g.

The unidentate anterior claws and two circumfili indicate a relationship to *Erosomyia* Felt from which it is easily separated by alar characters. The dentate anterior claws prevent the reference to this form to *Contarinia* and the same is true of the genitalia, which latter approach in structure those of *Thucodiplosis*.

Type.—*Toxomyia fungicola* n. sp.

Toxomyia fungicola n. sp.

The small, yellowish midge was reared February 3, 1911, from the teleutospores of *Puccinia* species on *Emilia sonchifolia*.

Male.—Length .75 mm. Antennae twice the length of the body, thickly haired, light brown; 14 segments, the fifth having the two portions of the stem with a length $2\frac{1}{2}$ and $3\frac{1}{2}$ times their respective diameters; the basal enlargement subglobose, the subbasal whorl thick, the circumfilum with long loops, those on the dorsal surface produced to extend beyond the subglobose distal enlargement, which latter has a scattering subbasal whorl of stout setae and a circumfilum with long loops, likewise somewhat produced on the dorsal surface and extending beyond the base of the following segment; distal segment produced, the basal portion of the stem with a length fully seven times its diameter, the distal enlargement subglobose and with a slightly tapering, finger-like process having a length five times its diameter; mouth-parts somewhat produced. Palpi: first segment short, subquadrate, the second with a length twice the first, rather slender, the third as long as the second, the fourth a little longer than the third; the entire body a pale yellowish or yellowish red; the genitalia somewhat fuscous. Wings hyaline, costa light straw, subcosta uniting with the margin at the basal third, the third vein a little beyond the apex; the fifth vein uniting with the posterior margin at the distal fourth, its short branch near the basal third. Halteres yellowish transparent, fuscous apically. Legs mostly pale straw, the distal tarsal segments darker; claws long, slender, evenly curved, the anterior unidentate, the pulvilli rudimentary. Genitalia: basal clasp segment moderately long, slender, with a distinct, broadly rounded, setose lobe at the internal basal angle; terminal clasp segment slightly swollen basally, long and evenly curved; dorsal plate short, roundly and triangularly emarginate, the lobes broad, truncate and sparsely setose; ventral plate a little longer, rather broad, triangularly emarginate, the lobes rather stout, slightly diverging and

setose apically; style moderately long, tapering, broadly rounded apically.

Female.—Length .75 mm. Antennae a little longer than the body, thickly haired, dark brown; 14 segments, the fifth with a stem one-third the length of the cylindric basal enlargement, which latter has a length over twice its diameter; subbasal whorl of setae stout and sparse; subapical band scattering; terminal segment produced, the basal enlargement subcylindric, with a length fully four times its diameter and apically a rather stout, finger-like process. Ovipositor short, the terminal lobes narrowly oval, slightly constricted basally and sparsely setose. Other characters nearly as in the male.

Larva.—Length 1.25 mm., rather stout, pale yellowish with pinkish extremities. Head rather long, narrowly triangular, the anterior third chitinized. Antennae rather stout, with a length five times their diameter and arising from distinct elevations; breast-bone wanting. Skin coarsely shagreened, the segments each with a lateral seta near the middle; posterior extremity contracted, the thirteenth segment half the width of the twelfth, the fourteenth about a third narrower than the thirteenth, truncate, with a long seta at each latero-posterior angle and two pairs of submedian short, stout, semi-transparent tubercles at the dorsal extremity.

Type.—Cecid a2134, N. Y. State Museum.

***Contarinia lycopersici* n. sp.**

The species described below was reared February 3, 1911, from the flowers of tomatoes, *Lycopersicum esculentum*. It appears to be allied to *C. solani* Rubs. though there are marked differences in colorational characters, and a comparison with a female specimen of the European form, kindly sent us by Prof. Rubsaamen, shows certain structural differences. The West Indian species has relatively longer and more slender antennal segments.

Male.—Length .75 mm. Antennae twice the length of the body, thickly haired, light brown; 14 segments, the fifth having the basal portion of the stem with a length one-half greater than its diameter, the distal part with a length $2\frac{1}{2}$ times its diameter; basal enlargement subglobose, the subbasal whorl sparse, the loops of the circumfilum long, those on the dorsum produced and extending to the apex of the segment, the distal enlargement slightly produced, broadly oval, with a sparse whorl of setae and a similar circumfilum, the loops of the latter extending to the tip of the basal enlargement on the following seg-

ment; terminal segment produced, the basal portion of the stem with a length four times its diameter, the distal enlargement fusiform, with a length nearly three times its diameter and apically with a long, finger-like process. Palpi: first segment short, subquadrate, the second narrowly oval, with a length about twice its diameter, the third one-half longer than the second, more slender, the fourth a little longer and more slender than the third. Mesonotum reddish brown, the submedian lines yellowish. Scutellum and postscutellum fuscous yellowish. Abdomen mostly fuscous yellowish. Wings hyaline or nearly so. Halteres yellowish transparent, fuscous apically. Legs mostly dark brown, the basal third of the tibiae, especially those of the posterior legs, yellowish; claws long, slender, evenly curved, the pulvilli a little shorter than the claws. Genitalia: basal clasp segment rather long, stout; terminal clasp segment stout, tapering; dorsal plate rather long, deeply and roundly emarginate, the lobes diverging, sparsely rounded; ventral plate deeply and triangularly incised, the lobes diverging, tapering, both sparsely setose; style short, tapering, acute.

Female.—Length 1 mm. Antennae nearly as long as the body, rather thickly haired, dark brown; 14 segments, the fifth with a stem one-quarter the length of the cylindric basal enlargement, which latter has a length $2\frac{1}{2}$ times its diameter; subbasal whorl sparse, subapical band rather long, the setae long and strongly curved; terminal segment produced, with a length four times its diameter and apically with a rather stout process, having a length fully twice its diameter. Palpi: first segment subquadrate, the second narrowly oval, with a length twice its diameter, the third a little longer and more slender than the second, the fourth longer and more slender than the third. Mesonotum reddish brown, the submedian lines yellowish. Scutellum reddish brown, postscutellum probably darker. Abdomen dark brown. Wings subhyaline, with rather distinct fuscous spots on costa and at the posterior margin near the basal third, at the distal fifth on the third vein and on the posterior branch of the fifth, some specimens showing a rather indistinct fuscous band near the distal fifth of the wing. Ovipositor, when extended, distinctly longer than the body; terminal lobes very slender, with a length five times the diameter and sparsely setose.

Larva.—Length 1.5 mm., yellowish white, rather stout. Head small; antennae short, stout; breast-bone with a subquadrate head, bidentate; the short, obliquely truncate, blunt teeth widely separated, yellowish brown, the remainder of this structure semi-transparent, the shaft being slender. Skin nearly smooth, posterior extremity broadly rounded.

Type.—Cecid a2135 and a2090, N. Y. State Museum.

***Hyperdiplosis coffeae* n. sp.**

The midge described below was reared February 3, 1911, from the fruits of the Liberian coffee tree, *Coffea liberica*. It is tentatively referred to this genus, since the claws are less strongly bent, while the circumfili are more produced than in other species placed in this group.

Male.—Length 1 mm. Antennae nearly twice the length of the body, thickly haired, light brown; 14 segments, the fifth having the two portions of the stem, each with a length about thrice the diameter; the basal enlargement subglobose, the subbasal whorl rather thick, stout, the circumfilum with loops extending to the produced distal enlargement, which latter has a length twice its diameter, a sparse whorl of rather long setae, subbasal and subapical circumfili, the loops of the latter extending to the apex of the segment; terminal segment produced, the basal portion of the stem with a length four times its diameter, the distal enlargement subcylindric, tapering distally and with a length four times its diameter and apically a long, finger-like process with a length four times its diameter and subacute distally. Palpi: first segment probably subquadrate, the second slender, with a length four times its diameter, the third a little longer than the second, more slender; the fourth as long as the third, dilated; eyes large, black. Entire body a pale yellowish. Wings yellowish white, costa very pale yellowish, the third vein uniting with the margin well beyond the apex of the wing. Halteres whitish transparent. Legs mostly a light straw, the distal tarsal segments darker; claws stout, strongly bent and swollen subapically, simple, the pulvilli shorter than the claws. Genitalia: basal clasp segment short, stout, obliquely truncate; terminal clasp segment as long as the basal clasp segment, swollen basally, curved; dorsal plate nearly as long as the ventral plate, triangularly incised, the lobes obliquely emarginate and sparsely setose; ventral plate long, broad, very deeply and roundly emarginate, the slender lobes diverging, narrowly rounded and sparsely setose apically; style long, stout, broadly rounded.

Female.—Length 1 mm. Antennae about as long as the body, thickly haired, yellowish brown; 14 segments, the fifth with a stem about three-quarters the length of the cylindric basal enlargement, which latter has a length thrice its diameter; subbasal whorl sparse, the subapical band thick, the setae long and strongly curved; terminal segment produced, the basal enlargement subcylindric, with a length four times its diameter and apically with a long, finger-like process. Ovipositor short, the terminal lobes narrowly lanceolate and sparsely setose. Other characters nearly as in the male.

Type.—Cecid a2133, N. Y. State Museum.

Chrysomela staphylea Linne in North America (Col.).

By FREDERICK KNAB, U. S. Department of Agriculture, Washington, D. C.

In order to settle, if possible, the identity of certain Coleoptera, described by Kirby, from Nova Scotia, I wrote letters to several collectors at Halifax. As the result of this correspondence I received a box of beetles kindly collected for me by Mr. Joseph Perrin, of MacNabs Island, near Halifax. They were all larger beetles, mostly familiar species, and none of the species I wished to see were among them. There were, however, three specimens of a *Chrysomela* (restricted sense) which I at once recognized as distinct from any of the species attributed to our fauna. Yet the insect had a strangely familiar appearance, and naturally the suspicion arose that it might be one of the numerous European species. So it proved, and the specimens were quickly identified as *Chrysomela staphylea* Linné, a very common species in Northern Europe. In fact, the species is one of distinctly boreal distribution, extending through Siberia and Northern Europe, and ranging southward to the Caucasus, Dalmatia, the Tyrol and the Pyrenees.

Comparison with European material and with descriptions showed that the Nova Scotia specimens agree in every respect with typical European ones. The beetle is uniformly ferruginous brown in color, with a slight brassy luster on the upper surface. Immature specimens are a lighter, opaque rust-red, without the metallic luster. In form it is similar to our *Chrysomela auripennis*, although slightly broader and with less prominent humeri. The pronotum is very finely and rather densely punctured. The elytral punctuation is coarser and more sparse, in more or less confused double series; in some specimens two or three impunctate intervals appear.

There appears to be but one previous record of the beetle from North America, and this with a query. A single specimen is reported by Mr. J. D. Evans as taken at Halifax in

1897¹. Mr. Evans had some doubt that his specimen belonged to the European species, for he had only a single European specimen for comparison and this showed differences in the punctuation and in size. A good series of European specimens of *Chrysomela staphylea* before me shows considerable variation in these respects, fully covering the differences noted by Mr. Evans. The three specimens recently captured by Mr. Perrin remove all doubt that Mr. Evans had the European species.

The occurrence of *Chrysomela staphylea* at a seaport in constant communication with Europe naturally leads to the supposition that it was introduced through commerce. It is barely possible that we have here an additional circumpolar species, but in this case it should have been found in other northern localities; however, our knowledge of the insect fauna, past and present, of boreal America is too limited to warrant a conclusion. All three specimens sent by Mr. Perrin were captured on MacNabs Island near Halifax. I wrote to Mr. Perrin to ascertain if much European shipping touched at this point, and the presence of the beetles could be accounted for in this way. Mr. Perrin replied as follows: "The beetle you refer to may have been imported with some farm and garden seeds that we have had, or else by the former owner of this place. There being no shipping to the island, I cannot account for it in any other way. Of course there is much shipping from Europe done at Halifax, but that is at least two and a half miles from the nearest point of land from here." Entomologists will agree with me that the probability of the beetle having been introduced with garden seed is rather remote—it probably reached the island indirectly, as it seems from the above record that it was previously established on the nearby mainland. At all events the insect is well established on the above named island, specimens having been captured at considerable intervals, one of them on June 18, 1910, the other two on August 5 of

¹List of Coleoptera from Halifax, N. S. Can. Ent., vol. 31, p. 320-321 (1899).

the same year. *Chrysomela staphylea* should be looked for elsewhere in eastern Canada. If the beetle proves to be restricted to a limited area about Halifax, it will be evident that it is an importation. On the other hand, wide distribution will indicate that the species is indigenous.

The beetle is one that would not be diffused rapidly, as it is sluggish in habits and incapable of flight. Although provided with wings, these are reduced in size and not functional. They are narrow, corneous pads, no longer than the elytra, and lie under these without folding. Several specimens that I examined, from both sides of the Atlantic, all showed the same condition. About the only chance for rapid distribution of such an insect would be along some river, where the hibernated beetles would be carried down stream by the spring floods; but this cannot operate in the case of a species which has become established at the seaboard.

Although *Chrysomela staphylea* is a common species in Europe, very little appears to be known of its habits. Rosenhauer² and Buddeberg³ have bred the beetle and described the early stages. Both obtained their larvae from eggs laid by captive females. Rosenhauer obtained eggs in September, and again in March from the hibernated beetles. The eggs laid in the fall did not hatch until the following spring⁴, a rather remarkable occurrence in a chrysomelid. We can hardly imagine the eggs surviving the rigorous winters of Nova Scotia. Eggs were obtained in March, by both Rosenhauer and Buddeberg, from females taken in flood drift. Rosenhauer states that these eggs hatched very irregularly during April and May; the larvae avoid the light and, particularly when young, are very sluggish.

² Entom. Zeitung, Stettin, vol. 43, p. 151-152 (1882).

³ Jahrbücher Nassau. Ver. Naturk., vol. 41, p. 33-34 (1888).

⁴ It is interesting, in this connection, to note the observation of Burdeberg on the hibernation of the eggs of *Timarcha tenebricosa* F. (l. c., p. 43). He found that the eggs deposited in the summer hibernated regularly, in spite of the fact that in July the young larvae were already fully developed within.

There appear to be no records of the food-plants of the beetle in nature—Buddeberg remarks that he has never found the beetle on a plant and most writers speak of the beetle as being found under stones, or running on the ground. Probably, like many other European species of *Chrysomela*, it is crepuscular or nocturnal.

The beetle was called "*staphylea*" by Linné, not because it was supposed to feed on the plant of this name, but on account of its resemblance in color to the seeds of the plant. Rosenhauer fed his larvae with *Mentha crispa* from the greenhouse, and later with *Mentha sylvestris* and *Ranunculus acris*—Buddeberg offered a great variety of plants to his beetles and found that they preferred *Veronica beccabunga*, leaving the other plants untouched. The larvae showed a preference for the same plant, but also ate *Mentha aquatica* and *Lycopus europæus*.

Notes on the Species of *Acronycta* and Descriptions of new Species (Lepid.).

By JOHN B. SMITH, Sc.D., New Brunswick, New Jersey.

Incident to the preparation of a paper on the Californian species of *Acronycta*, I found it desirable to compare my collection with the revision by Sir George F. Hampson, in Vol. VIII of his Catalogue of British Museum Noctuidæ. The receipt of a number of species for determination, including a little lot from Mr. E. Firmstone Heath, of Cartwright, Manitoba, gave further opportunity of comparing some of the species rather closely, and these notes are the result.

As a rule, I am inclined to follow Hampson in his identifications and synonymical references, even when I am not fully agreed, because of the desirability of getting at some fixed determination of species. Furthermore, he is usually right where he has had sufficient material upon which to base a satisfactory conclusion. Finally, there are some cases where a number of specimens marked types by the original describer

and distributed in different collections, are not really the same species, and in most of such cases the British Museum specimens have the best claim to be considered the determining forms. And so in the case of the *Acronycta*, I have accepted the references of Vol. VIII, except where I feel reasonably certain that they will not stand the test of future comparisons, or where for some reason an error would follow an acceptance of the conclusion.

With the method of arrangement adopted by Hampson, I do not agree at all; but that is a purely subordinate matter based on a difference in the fundamental characters used in making the subdivisions.

My own views are sufficiently given in the Monograph of the genus, Proc. U. S. Nat. Mus., XXI, 1—194, 1898.

Acronycta hastulifera S. & A.

Hampson records this species as unknown to him. Under the name *insita* Wlk., he figures on Pl. CXXVII f. 3, a species that is almost certainly the species in my collection and in others under the name *hastulifera*. My *denvera* is cited as a synonym of *insita*, which it is not, if *insita* is really *hastulifera*, as I believe. The descriptions of larvæ differ; but whether Dyar, who furnished both descriptions, had the larva of the Colorado form or not, I have no way of determining.

I believed my *denvera* to be a form of *dactylina*; in that I was probably in error, and it may be nearer to *hastulifera*. If there is a species *insita*, so near to *hastulifera* that neither the description nor the picture avail to separate the two, I do not know that species. I saw *insita* in 1900, and at that time compared the ♀ with ♂ *dactylina*.

Acronycta lepusculina Gn.

This species had been altogether misidentified in American collections and is the form I had determined as *insita*.

Hampson has pointed this out after an examination of the type and gives the name *chionochroa* to the form mistakenly characterized in the monograph under the Guenée name.

***Acronycta felina* Grt.**

My identification of this was erroneous. The scant material from the original locality led to an error in estimating range of variation. This error extended also to the author in labelling the original type series; hence the types are not conspecific. The British Museum material, containing the specimens from the author's own collection, must be accepted as having the true type, and that is as figured by Hampson. I have only one example, which had been associated with my *pacifica*.

***Acronycta metra* n. sp.**

Head, thorax and primaries very dark blue gray, powdered by black atoms, but not roughened or irrorate. Sides of palpi black, and a black line to base of primaries. Thorax without markings of any kind. Primaries without trace of transverse maculation: veins only a trifle darkened, so that the wing appears almost uniform in color. A narrow black basal streak, extending about one third across wing in sub-median interspace, and a slightly more conspicuous streak not continuous with it, through outer third of same space, not quite reaching the outer margin. Orbicular wanting, reniform indicated by a small blackish dot at outer angle of cell inferiorly. Fringes very narrowly cut with black over the interspaces. Secondaries soiled whitish, darker and with the veins marked in the female. Beneath whitish; all wings with a discal spot and a broken extra-median line.

Expands 41-49 mm. = 1.65-1.95 inches.

Habitat—Seattle, Washington: Colorado (Bruce).

The ♂ is the smaller, lacks the abdomen, but is otherwise in good condition. The female, from Bruce, is an old specimen that I had kept questionably as *felina* for many years, and is in fair condition. The thoracic vestiture is hairy, as in the *oblinita* series, the collar and patagia not well marked, the wing form trigonate, apices somewhat drawn out, much as in *frigida* Sm., and *cyanescens* Hampson.

***Acronycta turpis* n. sp.**

Head, thorax, abdomen and primaries very pale bluish gray, with a scant powdering of black scales. Palpi at sides and a narrow line to base of primaries black. Primaries with all the veins marked by black scales so as to make them traceable throughout their course. A narrow black streak from base through sub-median interspace, al-

most lost before the middle of the wing, then better marked again through outer third, almost to the outer margin. Orbicular lost; reniform a very narrow dusky crescent at end of cell. T. a. line lost. T. p. line traceable across the wing as a rather broad though vague whitish sinuate line. Secondaries white. Beneath almost snow white, with small discal spots, primaries with a trace of an extra-median line.

Expands 42 mm. = 1.70 inches.

Habitat—Provo, Utah, VII, 24.

A single male, in good condition, from Mr. Thomas Spalding. The species is an ally of *metra*, with similar habitus, vestiture and wing-form, but much paler and whiter throughout, with the narrow, crescent-like reniform and pale s. t. line. The simplicity of the maculation should render it easily recognizable.

Acronycta amicora n. sp.

Head, thorax, abdomen and primaries ashen gray, with a faint yellowish tinge. Palpi black at sides, with a narrow black line extending to the base of the primaries. All transverse maculation of primaries lost; all the veins slightly darker and feebly relieved. A narrow black line extends from base to outer margin through submedian space, traceable only as a line of black scales at the middle of its course. Another short black streak is in the interspace beyond the cell, and the fringes are rather distinctly cut with black on the interspaces. Orbicular elongate, decumbent, pointed anteriorly, obscurely outlined by black scales. Reniform a dusky lunule at end of cell. Secondaries soiled whitish, with a yellowish suffusion. Beneath whitish with a yellowish tinge, somewhat powdery, all wings with a good sized, round, somewhat diffuse discal spot, but without extra-median line.

Expands 46 mm. = 1.85 inches.

Habitat—Senator, Arizona.

One female, an old specimen and perhaps a little discolored. It is obviously related to *metra* and *turpis*, but differs from both by the black streak opposite cell and by the narrow, decumbent orbicular.,

There is nothing on the specimen to indicate the source from which I originally received it.

Acronycta hasta Gn.

This species as described by Hampson in Vol. VIII, p. 73, and figured on Pl. CXXIV, f. 22, is not the *hasta* of my collection or of my Monograph, nor, I believe, of Guenée. It is the species that for many years masqueraded as *clarescens* Gn., and was subsequently referred by me to *pruni* Harr. The type of *hasta* is not in the British Museum, and there is no statement by Hampson that he has seen it. Guenée's description does not in the least fit *pruni*, which is never a deep violaceous ashen—"cendré violatre foncé," but rather "gris-cendré clair saupoudré de noiratre." Nor could *pruni* ever be called "très voisine" of *furcifera*. As the matter stands, I prefer to retain *pruni* Harr., as representing the species now known to us in all stages, while for *hasta* I prefer to retain the dark blue gray species which is really a very near neighbor of *furcifera*. I might add that Hampson apparently includes under *furcifera*, the species that I have separated as *hasta*.

Acronycta telum Gn. Noct. 1, 45.

This species has not heretofore been definitely identified in collections. Guenée described it from a single male out of his own collection, comparing it with *furcifera* and *hasta*, and giving the locality as "Amerique Septentrionale." Walker turned the original description into Latin, abbreviating and laying stress upon the character of the secondaries, as by the terms of the original he was justified in doing. He gives the locality as "United States," but apparently knew nothing more of the species.

Mr. Grote, in the Bull U. S. Geol. Surv. VI, 571, 1883, translates Guenée's description into English, omitting, probably by accident, a portion of the description of primaries. He adds that "I do not identify this description." In Papilio, III, 67, he remarks that this must resemble *hasta* and *furcifera*.

In my Catalogue of 1893 no progress is recorded and the species yet stands unidentified.

In my revision of *Acronycta*, p. 87, 1898, *telum* is referred

as a synonym to *hasta* without explanation or comment. I do not at this time remember my reason for this action which has been followed without question by later writers, including Hampson in 1909.

Two female specimens received from Mr. Heath, one dated VI, 29, '08, the other, VIII, 19, '09, attracted my attention at once by their resemblance to *hasta* and their immediate suggestion of a different species, based first, upon the brilliantly clear maculation of primaries, and second, upon the pearly lusted blackish secondaries. On the underside especially, the secondaries are very strongly marked, and comparison with the original description of *telum* makes it as certain as an identification from a description can well be, that the real "*telum*" has been at last discovered.

It gives us the three species in the order described by Guenée—*furcifera*, *hasta* and *telum*,—close allies in a way, in the order seen by him, and makes his descriptions clear. *Furcifera* is the largest of the species and has a decided yellowish shading throughout, but more conspicuous in the secondaries, which are strongly mottled beneath and often have, in the best marked examples, a longitudinal black streak in the cell near base. *Hasta* is decidedly smaller, the primaries are blue gray, the black markings thicker and more conspicuous, the secondaries whitish with very little yellow shading, especially on the male. On the under side the mottling is much reduced, and in none of my specimens is there a longitudinal black bar in the cell.

Telum is as intense a blue gray as *hasta*, but is distinctly more black powdered, and the maculation seems more intensely black. The secondaries are really blackish, especially toward outer border and the pearly lustre is obvious. The under side is as heavily marked as in the best *furcifera* and the streak in the cell is obvious. It is more than likely, however, that this is a somewhat variable feature and may not be nearly so well marked in all examples.

Acronycta exilis Grt. and **A. modica** Wlk.

In the monograph I united these two forms. After seeing the types, in 1900, I admitted their possible distinctness (Can. Ent. XXXII, 335). Hampson describes and figures them as separate. After looking over the series before me, I am as undecided as ever and cannot find a single reliable character on which to base two series. There are always some three or four examples that will not fit better into one series than into the other. With the British Museum material only at hand, the two forms seem distinct enough; *exilis* being smaller, paler and apparently rare.

Acronycta inclara Sm.

This name was proposed by me in 1900, Can. Ent. XXXII, 335, for the species theretofore known as *hamamelis* in collections, and it has no type. There is a considerable range of variation in this aggregation, and it may be convenient to fix more definitely the one to be covered by this name. Hampson in his Catalogue Vol. VIII, p. 8, describes, and on Pl. CXXIV, 28, figures one of the common types, and this may be accepted as the type of the name.

There seems almost no end to the variations in this species, and many of these seem local; but there is on the whole a characteristic facies that distinguishes a series, and that is not well brought out in the figure. There is an obscure streak crossing the s. t. line in the sub-median interspace, beginning a little beyond the middle of the wing. From the beginning of this line a triangular dusky shade extends above it, reaching the outer margin at vein 7 and forming a darker triangular patch, which is traceable in every specimen and characteristic in a large series. There are variations in ground color from white to gray, mossy shadings, brown shadings and yellowish shadings, and no end to the differences in contrasts; but this one feature remains throughout.

I have had from Mr. Heath, at various times, nearly a dozen examples of what seems to be a local race, at least, and which he is inclined to consider specifically distinct from

inclara. It is a little smaller than the normal examples, lacks all reddish or mossy suffusions, and has the maculation a clearer, more contrasting white and black or blackish. The secondaries also are decidedly more blackish gray without the distinct yellowish tinge. I cannot, however, draw any line at present and call attention to the matter here for the benefit of those who may be so situated as to work out the relation of the two. As a race it may be called *inconstans*.

Acronycta tristis n. sp.

With all the normal maculation of *inclara*; but without contrasts, the lines and markings just enough darker than the ground to be easily made out. Ground color a uniform dark smoky ashen gray, the pale annulus to the round orbicular being usually the only obviously relieved feature of the wing. Secondaries sub-transparent white, soiled with blackish, tending to blackish in the female, the lines and discal spot of underside showing clearly. Beneath with a pearly lustre, blackish outwardly, both wings with discal spots and conspicuous, more or less lunulate, extra-median lines.

Expands 35-37 mm. = 1.40-1.50 inches.

Habitat—Canada VIII, 5; Cohasset, Mass., VII, 1, 4; Johnson City, Tenn., VII.

Four males and two females, in fair condition. These specimens had been included as uniform examples of *inclara* in my collection; but they differ obviously in lacking all trace of the triangular dark shading, which is characteristic of that species.

This is not the *hamamelis* figured by Hampson, despite its uniform dark tint. Hampson's figure shows correctly, the small, round, white-ringed orbicular which is characteristic of *afflicta* and its immediate allies. In none of the forms of the *inclara* series does this type of orbicular ever occur.

Acronycta haesitata Grt. = *A. clarescens* Gn.

In the monograph I concluded that these two names referred to one species, basing my opinion on the best available information as there set out. In 1900, when I saw the types, I wrote myself in error, (Can. Ent. XXXII, 335) and concluded that the species were distinct. Mr. Grote's species was

as I had it; but *clarescens* Gn., I concluded, was really the species that had been called so by Mr. Grote, and for which I had resurrected *pruni* Harris. This "*pruni*" is a common enough species, I had dozens of bred specimens, and I thought I knew it under all circumstances.

Hampson cites, in consequence, *A. clarescens* Gn., = *pruni* Harr. (Smith); *A. haesitata* Grt., = *clarescens* Sm., nec Gn. He figures *clarescens* and *haesitata* on Pl. CXXIV, figs. 29 and 21, respectively, apparently from the types, and of a certainty neither of these figures nor the descriptions can possibly refer to *pruni* Harr., which is the species figured and described by Hampson as *hasta* Gn.

In looking carefully over my series of *haesitata*, I have exact duplicates of the figures of both *haesitata* and *clarescens*, and find it possible to separate the series passably into two forms, satisfying the requirements of Hampson's tables and descriptions. The figures are characteristic, and I do not see how an error is possible; but if Hampson is right in his identification of these two forms, then my original conclusion that *haesitata* Grt. = *clarescens* Gn., is correct.

That would make necessary an admission on my part that with two specimens of a form so well known to me as *haesitata*, I positively declared one of them to be a distinct and equally well known other species, and that admission I am not ready to make. Hampson refers to two females from Trenton Falls as the types of *clarescens*, and that is in accord with Guenée's record. The female type of *haesitata* is from Pennsylvania. In my notes I refer to a "type" of *clarescens*, and a possibility remains that the two Guenée specimens are not specifically identical. The two certain points are that *clarescens* Hamps. = *haesitata* Hamps. and that *clarescens* Hamps. is not *pruni* Harr.

Acronycta hamamelis Gn.

Hampson lists this as a good species, closely allied to *afflicta*, based on one male and one female. The figure is based on the type, and from my recollection and notes it seems to be accu-

rate. I yet believe that it is not different from *afflicta*, all the characteristic maculation being obvious. The only disturbing feature is in the smoky secondaries, those of all the *afflicta* that I have ever seen being whitish.

I am ready, under the circumstances, to admit a species that I have never seen, and which is the true *hamamelis* Gn., as distinct from *afflicta* Grt.

Acronycta speratina Smith.

Hampson refers this as a synonym to *sperata*, mentioning it again under Ab. 1, as larger and paler, fore wing with the markings more diffused.

As species go in this genus, I am not ready to assent to this disposition of *speratina*, which is at least a very good geographical race, and I am inclined to hold out for its rank as a good species.

Notes on Pennsylvanian Diptera, with two new Species of Syrphidae.

By W. R. WALTON, Bureau of Entomology, Washington,
D. C.*

(Plate IX).

Criorhina (*Penthesilia*) *nigriventris* n. sp.

Habitat Pennsylvania. ♂ Length 17 mm. Antennae blackish, 1st joint black, shining, a little longer than second which is black verging to brown on apical end. Third joint distinctly broader than long, front border convex. Front and face golden yellow pollinose, somewhat more dense on sides. Cheeks and oral margin shining black. Sides of antennal tubercle and transverse impression of face sparsely clothed with long black hairs. Pile of ocellar triangle black, that of vertex yellow. Thorax black with a median opaque band, also an elongate opaque spot extending from post alar callus nearly to but not touching the transverse suture. Elsewhere shining and covered with long pale yellow pile excepting a faint transverse band of black hairs just caudad of the transverse suture. Scutellum black, shining, covered with long pale yellow pile. Pleurae yellow pilose. Abdomen broad, entirely shining pitchy black, covered with long

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black pile excepting a triangular area on the disc of second segment which is nearly bare. All femora black, shining, bearing long black hairs. Tibiae black, apical ends brownish. Hind tibiae strongly bent ventrad. Front and middle tarsi light brown, apical joints darker. Hind tarsi black above and brown below. Wings smoky, stigma yellowish.

Type a unique ♂. Deposited in U. S. National Museum, Washington, D. C. Collected by W. S. Fisher, Harrisburg, Pa., March 24, 1910, resting on a tree trunk. Mr. D. W. Coquillett has kindly compared this and the following species for me.

***Syrphus fisherii* n. sp.**

Habitat Pennsylvania. ♀ Length 8 mm. Antennae brownish, eyes glabrous. Face yellow with whitish pollen; in the middle a shining brown stripe extends from the oral margin across the facial prominence but ends abruptly before the base of antennae; oral margin brown. Front, shining pitchy black with a band of grayish pollen forming a continuous Gothic arch above antennal tubercle; the sides of this arch run down along the eyes and coalesce with the facial pollen. Antennae inserted on a distinctly yellow ground. No part of face or front shows any trace of metallic color. Thorax black with a faint green metallic tinge, scutellum and halteres dull yellow, scutellum brown at extreme ends. Abdomen rather narrow, somewhat constricted at base, first segment black; second segment, yellow cross band very broad, narrowly interrupted forming two large, lemon yellow, quadrate spots reaching anterior margin, remainder of segment shining black; third and fourth segments shining black, with basal, narrow, nearly straight, interrupted, cross bands of ochre yellow, reaching laterad but not touching anterior margin of segment; fifth segment black with small ochre yellow triangle at outer corners touching anterior margin, also a very narrow lunule bordering posterior margin; remainder of abdomen black. Front and middle legs testaceous, femora brown at base. Hind legs blackish, knees brown.

Type a unique ♀, from Inglenook, Pa., September 12. The species is named in honor of Mr. W. S. Fisher, who collected it and to whom the author is indebted for this and many other fine Diptera.

***Microdon laetus* Loew.**

Type locality, Cuba. The validity of this species seems previously to have been somewhat doubtful. The specimens

from which the following descriptions are drawn were taken in the vicinity of Harrisburg, Pa., and have been determined by Mr. D. W. Coquillett.

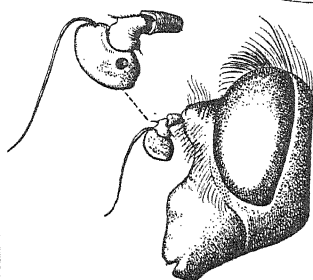
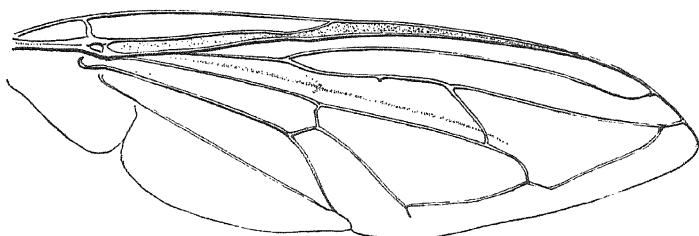
♂ Length 10 mm. Slender, shining metallic green. Face metallic shining green, narrow, sides parallel, sparsely clothed with pale yellow pile; front rather strongly constricted midway between ocelli and base of antennae, metallic shining green excepting ocellar tubercle which is violaceous; pile of front black sprinkled with yellow. Antennae black, third joint somewhat shorter than first. Ocelli quite remote from vertex. Eyes shortly and sparsely pilose. Thorax, dorsum and pleurae metallic shining green, thinly covered with pale yellowish pile which is more dense on pleurae. Scutellum subconvex, metallic green, impressed, sparsely pale yellow pilose, bearing an obtuse concolorous tubercle upon each side of apex. Abdomen slender, metallic green, punctulate and thinly clothed with pale yellow pile; apical segment blackish. Femora and tibiae metallic green; tarsi blackish above and brown beneath.

♀ Differs as follows from ♂. Pile of face nearly white, sides of front parallel. Color of entire body of somewhat bluer cast. Disc of thorax with violet tinge; last two segments of abdomen violaceous.

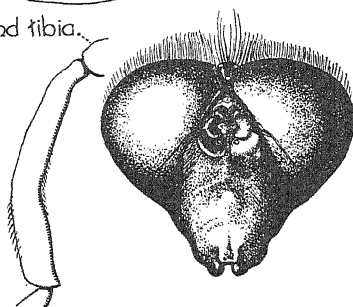
One specimen, Carlisle Junction, Pa., F. Craighead. One specimen, Enola, Pa., H. F. Adams. One specimen, Rockville, Pa., author.

Idana marginata Loew.

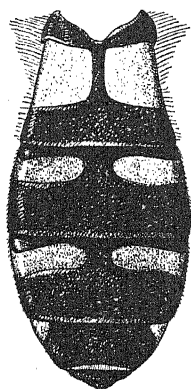
In life this is a very handsome species. Apparently it is quite local in distribution and exists but a short time in the adult stage. It is to be found in shady spots bordering roadsides or along the edges of wooded land, and seems to be particularly fond of roosting on old rail fences, and is to be sought only upon warm, still days. It has the habit in common with many other *Ortalids* of strutting about with the wings held at right angles to the body, occasionally rotating them through a quarter circle forward and back while held in this position. The species flies swiftly but usually alights within a few feet of its original resting place. During life the darker portions of the wings and body have a metallic purplish luster which entirely disappears in dead and dried specimens. Taken rather plentifully some years in June near Harrisburg, notably at Progress, Pa., in 1909 by Mr. H. D. Bailey and the writer.



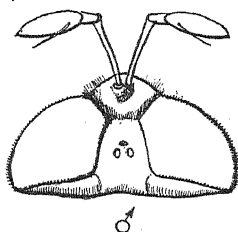
Hind tibia.



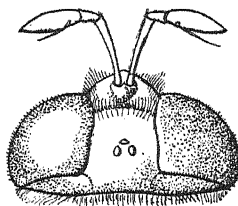
Criorhina nigriventris, details.



Syrphus fisherii, abdomen.



♂



♀

Microdon laetus,
heads ♂ ♀

Eustalomyia vittipes Zett. (*Anthomyiidae*).

In describing the male of this species, Mr. P. Stein comments upon the rarity of the fly in collections. It may be of interest, therefore, to record the fact that this fly has twice been reared from material collected from the interior of rotten logs in the winter season at Harrisburg, Pa. The insect was in the pupal stage and upon both occasions was in close proximity to cells of hymenopterons. Collections made by Paul Myers and A. B. Champlain. The following hymenopterons were reared in connection with it. *Crabro* (*Xestocrabro*) *trifasciata* Say, *Crabro maculatus* Fabr., *Thyreopus* (*Blepharipus*) *impressifrons* F. Sm. and *Pemphredon concolor* Say.

The puparium is chestnut brown, 8 to 9 mm. in length and from 2 1-2 to 3 mm. broad. Dorsally extremely polished, ventral side minutely wrinkled between the segments.

Ectecephala albistylum Macq.

Type locality North America. This rather curious Oscinid seems to have escaped recording for some reason. It seems to be not uncommon in the vicinity of Harrisburg, Pa., Mr. W. S. Fisher having swept it from grass on several occasions, and the writer has also taken it in Harrisburg. Mr. D. W. Coquillett has confirmed our determination.

Pyrellia serena Meigen. = (*P. cyanicolor* Loew.).

This Muscid, apparently adventitious from Europe, appears to have been overlooked by collectors; it is rather common in Pennsylvania, but as it resembles superficially the much more common *Morellia micans*, its presence in collections possibly remains unsuspected.

The distinguishing characters may be summarized as follows: Color of body, dark steely blue, occasionally greenish blue; thorax with three longitudinal, rather faint, hoary pollinose stripes. Sterno-pleural bristles 1-3; a stout bristle on the flexor surface of the middle tibia, first posterior cell rather widely open, 4th vein being only gently curved forward.

I first recognized this species among some Muscids collected by Mr. Erich Daecke, on the flowers of *Trillium erectum*,

near Harrisburg, and which were referred to me for identification. Subsequently it was found in both my own and Mr. Daecke's collections, having been confused with *Morcellia micans*, which it quite closely resembles.

From several collections made during the winter months by Mr. A. B. Champlain at Harrisburg, Pa., it is shown that at least some of the adults of both sexes hibernate in such places as old stumps and rotten logs.

Observations on the Lepidoptera of St. Louis, Missouri and Vicinity during 1910.

By THE MEMBERS OF THE ST. LOUIS ENTOMOLOGICAL CLUB.

Compiled by PAUL A. SCHROERS, St. Louis, Mo.

The salient feature was the scarcity of Rhopalocera and the abundance of Heterocera.

Following several weeks of hot weather during March and early April, all the early species of Lepidoptera, double brooded and overwintering forms were on the wing. Then came a severe cold wave with blizzards and killing frosts which left the green garb of Spring burnt to a rusty crisp, and insect life practically annihilated. It was a dreadful blow, from which many species never recovered fully. Most of the ovipositing was over and newly hatched caterpillars, as well as others that had hibernated, were found in icicles hanging from trees and shrubs.

Those that suffered mostly were the: Pieridae, Lycaenidae and Papilionidae. The latter, however, recuperated somewhat in the second brood.

Here are the principle observations made on different species following the usual order:

RHOPALOCERA.

Phyciodes—Common in late summer only.

Grapta—Unusually common; the elms in and around the city being fairly covered with larvae, except *progne* and *coma*.

Vanessa and *Euptoieta* scarce.

Junonia coenia—Absent altogether. Not a single specimen seen by any member of the Club.

Basilarchia astyanax—Normally common.

Basilarchia disippus—Very scarce, showing its larva to be possibly more sensitive to sudden extremes of temperature than that of the preceding species.

Apatura clyton—This species outnumbered *Apatura celtis*; it is usually by far the reverse.

Anaea andria—Mr. Hermann Schwarz found this insect very common at De Soto, Mo., on Oct. 12 to 17, 1910, but mostly males. In the near vicinity of St. Louis the appearance of both sexes was normal.

Coenonympha eurytris—This species, which usually disappears in July, was yet very much in evidence in late September.

Satyrus alope—Numerous specimens were taken by the members of the Club at West Kimmswick on their field day, July 17th.

Thecla—Very scarce; *Thecla titus* was captured at West Kimmswick by Mr. J. Nelle on the same date.

Chrysophanus—Very scarce, *thoe* as well as *hypophleas*.

Pierinae—Fairly scarce around St. Louis. Mr. Hermann Schwarz, however, found the following species unusually common near De Soto: *Cotias philodice*, *eurytheme*, *Zerene coesonia* and var. *roscia*; *Eurema nicippe* and *euterpe*.

Hesperiidae: normal.

New species taken—*Pamphila bellus* and *Thanaos naevius*.

HETEROCERA.

The following species were unusually common:

Hemaris thysbe and *diffinis*—This seems to indicate that their eggs withstood the intense cold of late April.

Ampelophaga choerilus—Plentiful at Creve Cœur, Mo. Usually scarce.

Smerinthus geminatus, *Marumba modesta*, *Paonias myops* and *excaecatus*, *Cressonia juglandis* in wide variations, *Actias luna*.

Callosamia promethea—This species seems to have had two distinct generations, one pupating in July and the other in October. It was extremely common, 1745 cocoons being taken by the writer on the hills near Creve Cœur Lake. Two hundred was considered a good harvest so far.

Citheronia regalis—Many females were caught by the writer at lights in the country and no males, while Mr. Hosenfeldt captured only males at light in the city. From the above females 432 fertile eggs were obtained and larvae raised.

Adelocephala bicolor and *bisecta*—Of these a fine series was obtained by Mr. Geo. Hosenfeldt.

Other species very plentiful—*Euthysanotia grata* and *unio* *Phoecima lunifera*, *Homoptera lunata* and *edusa*.

New species recorded—*Pygarcia spraguei*, *Schinia lynx* and *jagarina*, *Choephora fungorum*, *Lagoa crispata* at West Kimmswick and the little day-flying *Rheumaptera hastata*.

The collecting of Catocalae was remarkable for the sharp contrast between good and unproductive days. On July 4th Mr. F. Malkmus found almost every tree trunk occupied by them in a grove that had been given up as deserted by the other collectors after numerous fruitless expeditions.

Amongst the most remarkable captures of last summer, the following are foremost:

Catocala lachrymosa var. *ulalume* Strecker, one male taken at Meramec Highlands on the trunk of a white oak, Aug. 25th.

C. lachrymosa var. *selica* French, one female at the same locality, Aug. 20th.

C. parta Guenée, one male, same locality, July 25th. This is the most southern point at which this species was taken.

C. serena Hy. Edwards, one male, on black oak, same locality, July 25th.

These captures all stand to the credit of Mr. Ernest Schwarz.

C. viduata Grote. Four specimens were taken by Mr. Hermann Schwarz near Columbia, Ill., about fifteen miles from St. Louis, Aug. 10th.

Certain species of Sphingidae seem almost threatened with annihilation, through the unusual activity of parasites of the Ichneumon type. *Dolba hylaeus* larvae showed a percentage of 95 parasitized, while *Ceratonia amyntor* and *undulosa* caterpillars were all lost. Even *Cithronia regalis* and some of the woolly bears which are usually immune from the attacks of these parasites, were attacked by them this summer.

SO-CALLED CARRION-FEEDING COLEOPTERA OFTEN NOT CARRION-FEEDERS. —Observations reported by Mr. C. F. Selous, who watched the behavior of insects attracted by small carcasses (rat, mole, young rabbit), lead him to think that species of *Aleochara*, *Creophilus*, *Leistotrophus*, *Silpha*, *Hister* and *Saprinus* feed upon the Dipterous larvae to be found in the decaying bodies and not on the decaying substance itself. He is not convinced that even *Necrophorus* is a true carrion-feeder, but thinks it possible that it feeds on "smaller Coleoptera as well as, or instead of, the fly larvae," nor does he think that "the burying of the carcass is due only to the *Necrophori* or that it is a purposive act." He suggests that its sinking into the ground is an accompaniment of the processes of decay and of the action of deleterious juices on the vegetation which chances to lie beneath the cadaver. Notes on the manner in which Coleoptera approach the dead animals are included, and a suggestion is made as to the importance of the feeding habits of these beetles in the destruction of Diptera conveying human diseases. (Ent. Mo. Mag., April, 1911).

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, four weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.—Ed.

PHILADELPHIA, PA., JULY, 1911.

The author of an article recently contributed to the NEWS asks, "Could you not write a short editorial along the line of indiscriminate naming of new species from one or two specimens?" The topic is an old one and probably most of us who have perpetrated descriptions of *species novae* have erred "along the line" complained of by our correspondent. It may, or it may not, be true that more of such misjudgments were made in the days when collecting in the United States west of the One Hundredth Meridian was attended with much risk to the collector's scalp, and as a result of that risk long series of varying specimens were the exception and not the rule. The temptation to make known what appears to be undescribed has always been strong in the possessor of an apparent rarity and, on the other hand, not a few entomologists have regretted the excess of caution whereby they or their friends have lost the opportunity of being first in the field or in the printed page. Here as elsewhere there is a golden mean to be sought, the over-timid to be encouraged to press onward, the hasty to be checked until it is certain that he has made himself acquainted with the many sources of information before he commits himself and the journal to the announcement of a novelty.

We would remind our readers of the statement printed on the second page of the cover of each month's issue of the NEWS that *no numbers are published for August and September.*

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

THE RECENT CLASSIFICATIONS OF COLEOPTERA of Lameere, Ganglbauer and Kolbe, not hitherto discussed in English, are described in articles by Mr. C. J. Gahan, beginning in the *Entomologist* for April, 1911.

CHIRONOMID LARVAE PARASITIC WITHIN SNAILS.—Mr. K. H. Barnard reports, in *The Entomologists' Monthly Magazine* for March and April, 1911, the finding of living, mottled green and red Chironomid larvae in the mantle and mantle cavity of the snail, *Limnaea peregra*, in the fountains in Trafalgar Square, London. He observed a larva entering the pulmonary orifice of the snail. The presence of these parasites "inconveniences the host," resulting in some cases at least in its death, but apparently not producing dwarfing or deformity.

WE regret to learn that "Arcadia" at Sound Beach, Connecticut, the home and laboratory of Mr. Edward F. Bigelow, President of the Agassiz Association and Editor of *The Guide to Nature*, must be vacated and that Mr. Bigelow is obliged to seek quarters elsewhere. The Agassiz Association, under the presidency of Mr. Harlan H. Ballard, did a great work in interesting the young people of America in natural history in our own youth and Mr. Bigelow deserves aid and encouragement in his endeavors to continue his predecessor's beneficial labors. A fund, amounting on June 8, 1911, to \$826.75, has been started for a new Arcadia, and we wish it and our contemporary *Guide* every success.

PLUSIOTIS BEYERI SKINNER.—This elegant beetle, described by Dr. Skinner from the Huachuca mountains of Cochise County, Arizona, appears to be abundant in northern Sonora, Mexico. Mr. J. R. Haskins, of Los Angeles, has recently given me a small series from Cananea, where he reports it to be common about arc lights. His specimens were taken July 18, 19, 1910, near the Chivatena (Sheep Herder) Mine, at an elevation of about 5,000 feet. He also took a few *lecontei* and *gloriosa*. Mr. Haskins is not a coleopterist, and collected the specimens only on account of their beauty. No doubt a coleopterological collector visiting the lights there at the proper season could reap a rich harvest. I took a few *beyeri* in the Huachucas this last season, one the first day of June and others up to July 26, but they were few and far between. There seems to be no established rule as to obtaining them. I have taken examples at light and others flying at mid-day in the hot sunshine. Not a few deceased but mutilated remains were

found. The period of *life* in *beyeri* as an adult, is evidently rather brief. Mr. C. R. Biedermann, Entom. News, vol. 18, p. 7, '07, has published an interesting account of his experiences with *beyeri* in the Huachuclas.—KARL R. COOLIDGE.

AN INTERNATIONAL ANTI-LOCUST COMMISSION.—"J. Lawrence-Hamilton, M. R. C. S., of 30 Sussex Square, Brighton, England, sends us a reprint from the London *Financial News* of February 13, 1911, in which he urges the organization of an International Anti-Locust Commission. He points out what an enormous amount of capital is invested in Argentina and in the development of its agriculture, and then shows the immeasurable damage done by the locusts, thereby presenting a strong argument for a study of conditions which would result in the practical handling of the locust problem. He refers to the wonderful results which have come from the efforts to suppress the mosquito, and claims that similar success can meet a fight against the locusts."—*Bulletin of the Pan-American Union* (Washington), March, 1911, p. 401.

THE GREEN TREE ANTS OF NORTH QUEENSLAND.—Dr. R. A. O'Brien, describing some of the habits of these insects at the meeting of the Zoological Society of London, of May 3, 1910, said: The Green Tree-Ant is found in the open forest country or "bush" on the edge of the thick jungle or "scrub," along the sea-coast of Northern Queensland. It is a very active pugnacious insect, from half to three-quarters of an inch long, living wholly or almost wholly in trees. The nest is built on the bough of a tree and consists of a very large number of leaves, generally fresh and green. These are matted together with a gelatinous material exuded from larvae which the worker ants bring up to the site of the projected nest, where other ants hold the edges of adjacent leaves together. This process is repeated until the bundle may be several feet in diameter.

The bridge formed of the bodies of the ants shown on the [lantern slide] screen was re-formed, when broken, by festoons of ants hanging from the upper leaf until some of them, dropping from the festoon, joined momentarily with others on the top of the leaf and twigs below. Others quickly joined in strengthening the bridge until it was about four ants' width and eight ants' length. Then the one leaf was seen to be dragged slowly nearer the other, decreasing the bridge to five ants' length, and at this stage it remained for several days, when I left the place. The ants "on duty" in the bridge over which other ants ran to and fro, carrying their "game" were watched carefully for eighty minutes, and none in the center of the bridge was relieved during that time—a rather remarkable feat of strength and endurance.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), excluding Arachnida and Myriapoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted. This (*) following a record, denotes that the paper in question contains description of a new North American form.

For record of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

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schrift, Stuttgart. **227**—Memorias, Instituto Oswaldo Cruz, Rio de Janeiro. **239**—Annales, Biologie Lacustre, Brussels. **243**—Yearbook, Department of Agriculture, Washington, D. C. **266**—Sitzungsberichte, d. k. B. Gesellschaft der Wissenschaften. Mathematische-naturwissenschaftliche Classe, Prag. **274**—Archiv für Zellforschung, herausgeben von Dr. R. Goldschmidt, Leipzig. **303**—Entomologiske Meddelelser, udgivne af Entomologisk Forening, Copenhagen. **305**—Deutsche Entomologische National-Bibliothek, Berlin. **313**—Bulletin of Entomological Research, London. **333**—La Revue Scientifique du Limousin, Limoges. **334**—Proceedings of the American Academy of Arts and Sciences, Boston. **335**—Smithsonian Miscellaneous Collections. **337**—Meddelelser om Grønland. Denmark Ekspeditionen til Grønlands Nordostkyst, 1906-08, Copenhagen.

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THE HOUSE FLY—Disease Carrier.—An account of its Dangerous Activities and of The Means of Destroying It. By L. O. Howard, Ph.D., New York. Frederick Stokes Company, Publishers. Price \$1.60.

In the last few years this insect has received a large amount of attention from many sources. A large number of articles have appeared in relation to it in scientific, medical and popular magazines and in the newspapers. The house fly has been found guilty of many offences and the general public has become interested in it. Dr.

Howard has taken 312 pages to tell the story of the species and its iniquities and has done the work admirably. There is a frontispiece showing *Musca domestica* in all its glory, and forty text-cuts. The scope of the work is shown by the main headings of the various chapters: Zoological Position; Life History and Habits; Natural Enemies; Carriage of Diseases by Flies (typhoid fever, cholera, dysentery, diarrhea, tuberculosis, anthrax, yaws, ophthalmia, diphtheria, smallpox, plague, tropical sore and parasitic worms); Remedies and Preventive Measures; Other Flies Frequenting Houses; Bibliography and five Appendices as follows: Flies Frequenting Human Dejecta and those found in Kitchens; On some Flies Reared from Cow Manure; Regulations of the Health Department of the District of Columbia Relating to House Flies; Orders of the Commissioners of Columbia; Directions for Building a Sanitary Privy; A Simple Apparatus for Use in the Safe Disposal of Night-Soil.

Nothing of importance appears to have been overlooked and the volume covers the subject in all its phases carefully and accurately. —H. S.

NATURE SKETCHES IN TEMPERATE AMERICA. By Joseph Lane Hancock, M.D., F.E.S. With 215 original illustrations in the text and 12 colored plates by the author. Chicago. A. C. McClurg & Co., 1911. 12 mo., pp. xviii, 451. \$2.75.

This book is divided into eight sections: I. Evolution and Natural Selection (Introduction); II. Adaptations in Animals and Plants, with examples; III. Protective Resemblance, with examples; IV. Mimicry, with examples; V. Warning Colors, Terrifying Markings and other Protective Devices, with examples; VI. Animal Behavior, with examples; VII. General Observations and Sketches Afield, with examples; VIII. Ecology—Interpretation of Environment as exemplified in the Orthoptera.

The method of treatment is set forth in the preface: "The work has been divided into sections mainly through an endeavor to show the philosophy of evolution. First, I have brought forward sketches showing special adaptations and animal behavior. Secondly, by walks afield I have attempted in a simple manner to show the application of evolution to the objects viewed. In the table of contents will be found other subdivisions of the subject. When not otherwise stated, these word sketches have been drawn from my diary notes covering many years, made at Lakeside, Berrien County, Michigan."

On a frame-work of copious quotations, summaries and abstracts of the works of the great and well known evolutionary biologists, Dr. Hancock has hung his own observations as illustrations. He

treats many of the most fundamental and difficult problems in organic nature and it is too much to expect that his views of the significance of the structures and habits which he describes will satisfy all his readers. The book will no doubt fulfill one of its author's aims in suggesting to field naturalists and nature lovers some of the deeper meanings of the phenomena all around us.

More consideration is confessedly given to the insects than to other groups of animals. Hymenoptera, Lepidoptera, Diptera, Orthoptera, Coleoptera, Hemiptera, Neuroptera, Odonata and Spiders all figure in these interesting pages. As is quite appropriate to the author's well-known position as a specialist, the Orthoptera receive a larger share of attention than any other insects, the eighth section comprising 118 pages and including a list of Classified Habitats of Various Species of Orthoptera based on their egg-laying sites, to show their relation to plant formations in general (11 pp.), and four pages of Definitions of common environmental complexes and the various habitats of plants grouped under formations. There is an apparently full index of 17 pages.

The plates are three-color reproductions from colored photographs, most of them presenting flower and insect groups.—P. P. C.

PROF. Vernon L. Kellogg's *THE ANIMALS AND MAN, An Elementary Textbook of Zoology and Human Physiology* (New York, Henry Holt & Co., 1911, 16 mo.) devotes 70 pages to insects out of a total of 495, which is, perhaps, an instance of admirable self-control on the part of its distinguished entomological author. From a pedagogical point of view it may be interesting to note how those 70 pages are distributed, in the different parts of the book: External structure of the grasshopper 3, Mosquitos and caterpillars 12, Insects in general 4, Fighting insect pests 11, Mutual Aid and Communal Life 15, Colors and Markings of Animals 12, Insects and flowers 10, Collecting and Preserving 3.—P. P. C.

Doings of Societies.

AMERICAN ENTOMOLOGICAL SOCIETY.

Meeting of April 27th, 1911. Dr. Philip P. Calvert, President, in the chair, fifteen persons present.

Dr. Skinner made some remarks on the classification of the Hesperidae and said he believed in using any available characters for keys, irrespective of natural affinities. Mr. Rehn

said he approved of using all available characters for such a purpose.

Dr. Calvert exhibited a small collection of Odonata from Pennsylvania, which Mr. E. Daecke had submitted for identification. The most interesting specimen among them was a male *Aeshna mutata* Hagen (as defined by Messrs. Williamson, 1908, and E. M. Walker, 1908), labeled "W. Fairview, Pa., VII, 4, 10, coll. by Kirk." This is the first record of the species for Pennsylvania, previously known localities being Massachusetts and Indiana.

Mr. Rehn exhibited representatives of a number of bizarre species of Acrydinae (Tettiginae of most authors), eighteen genera being shown. A number of the species in the series were new forms from Ruwenzori and the Virunga volcanoes, Central Africa. Particular attention was called to the superficial resemblance of species of *Choryphyllum*, *Hypsaesus*, *Xerophyllum* and *Trypophyllum* to the species of Membracidae.

Mr. Cresson exhibited a very large Acanthomerid fly taken by Prof. Stewardson Brown in Venezuela. It lives in the forest.

Dr. Calvert read an extract from an article in the *Entomologist's Monthly Magazine* on Carrion-feeding Coleoptera, in which the author maintained that the beetles visited the carrion in search of dipterous larvae. Mr. Wenzel said the length of time the carcass has been dead largely determined the genera and species of Coleoptera in attendance. Mr. Laurent said *Necrophorus* came first and *Silpha* afterward.

Dr. Calvert also called attention to articles by Mr. C. J. Gahan in *The Entomologist* on recent classifications of the Coleoptera, and to one in the *Entomologist's Monthly Magazine*, in which it was stated that certain Chironomid larvae were parasitic in snails.

It was decided to hold the meetings in June and December on the second Monday instead of the fourth Thursday.

HENRY SKINNER, *Secretary*.



DANIEL WILLIAM COQUILLET.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

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Daniel William Coquillett.

(Portrait, Plate X.)

Daniel William Coquillett was born January 23, 1856, on a farm in Pleasant Valley, between Woodstock and Marengo, Illinois, and died July 7, 1911, at Atlantic City, New Jersey, of heart failure.

It was with great regret that we heard of the death of our leading Dipterist. There are many who will miss his cheer, and his help in the determination of their finds in Diptera, and the United States National Museum has lost a valuable member of its staff.

He had been interested in insects as a young man on his father's farm in Pleasant Valley, and he contributed liberally to the literature of applied entomology. In 1881 he became Assistant State Entomologist of Illinois, but was compelled to remove to California for his health, where in 1885 he became field agent for the Division of Entomology of the United States Department of Agriculture, and continued as such until 1893, when he was transferred to Washington as an assistant to the Entomologist of the Department. In 1896 he was raised to the office of Honorary Custodian of Diptera of the U. S. National Museum, which he held at the time of his death.

While in California he did valuable work in the suppression of insect pests which were causing much damage, particularly the scale insects and locusts. He discovered and perfected the hydrocyanic gas treatment which is used to-day for the control of most of the scale insects, by the fruit growers of California and elsewhere. He also perfected a mash which successfully checked the onslaughts of the locusts or grasshoppers in Central California. It was through his careful thorough work that the parasite of the cottony cushion scale was established to destroy that pest.

Since 1883 he contributed many papers on biological and systematic Dipterology, especially the latter, which are invaluable to the students of North American Diptera. Among these are papers on the Bombyliidae, Asilidae, Empididae, Therevidae, Culicidae and Tachinidae which are monographs or synopses of most of the genera and species of these families. His last paper of note, entitled "The Type-Species of the North American Diptera" was completed a short time before his death, as the result of many years' study, and is of the utmost importance to students of this order. His work is to be classed with that of Loew and Osten Sacken in its importance, and his connection with the U. S. National Museum as custodian of Diptera gave him the opportunity to investigate and study along his special lines with the aid of the best collection. The work of determining the great mass of material received by the Museum, gave him little time to devote to the descriptions of new forms, so that we are now complaining of his short diagnoses. He described over 1000 species from North America and many from other parts of the world. His views regarding the limits of species, and on nomenclature were very conservative, and no amount of favor, sentiment or criticism would influence him in his opinions. That he was one of the greatest American Dipterists there is no doubt, and there are few if any who can fill his place as well as he did. He was a member of the Washington Academy of Science, the Washington Entomological Society (its president 1903-1904), the Entomological Society of America, the Association of Economic Entomologists, and the American Association for the Advancement of Science.—E. T. C., JR.

Collecting in Southern Arizona.

By KARL R. COOLIDGE, Ceres, California.

One would scarcely think when viewing through a car window the barren saline alkali plains of southern Arizona and the various mountain stocks that loom up on all sides, that such a region could afford anything of particular interest to the entomologist. Yet these mountains, and especially the Huachucas, are as rich, if not richer than any other collecting grounds in the United States.

For the past thirty years or more, naturalists have collected here in all branches of biology, but new and interesting discoveries invariably greet the latest arrival, and it will be many years before we shall have obtained a satisfactory faunal knowledge. As we have no way of judging the future but by the past, I may presume then that in the coming years entomologists will continue to visit this region, and my object in presenting the article is that it may be of some service to future collectors. For, having strenuously gone through the mill myself, I can assure the intending entomologist that experience as a teacher here exacts heavy dues, and unless one is acquainted with the country and the conditions governed by its environment, he may lose much precious time, and otherwise suffer undesirable inconveniences.

The Huachuca Mountains, on the Sierra Espuela, as they were termed by the early explorers, lie in the extreme southwest corner of Cochise County, and are almost wholly within the United States, extending from the International line in a northerly and somewhat westerly direction to a distance of about forty miles, reaching the Barbcinari River, which empties into the San Pedro at Fairbanks. The range is composed of a single backbone or ridge, the highest point of which is Hasslops, or Miller Peak as it is better known, an elevation of 9472 feet, and the mountains rise to this from a base level of nearly 5000 feet. The western canyons are quite short and with little or no water, as the slope on that side is steep and rugged. On the eastern slope, however, the canyons are broad-

er and the majority of them well watered. Montezuma Canyon borders on the line, and the canyons from there are Ash, Clark, Miller, Carr, Ramsey, Brown, Tanner, Rock and Fort. Of these Ramsey is by far the best and most logical, as it contains a good stream, is easy of access and is quite gradual in its ascent. Miller Canyon has also been collected extensively. Tanner Canyon, or Garden Canyon as it is now known, the Post garden being situated there, has the largest flow of water, which has been reported as containing fish. On the western slope the most prominent canyons are Cave, Bear, Copper Glance, and Old Mill, but in none of these would I consider it advisable to camp permanently. Cave Canyon, as the name indicates, contains a number of caves, in one of which I believe water has been found, and some interesting blind forms may possibly occur there. In Montezuma Canyon the collector is quite liable to encounter some new introduced cave subspecies, in the nature of Mexican mescal smugglers, who rendezvous in that locality. Ramsey Canyon can easily be reached from Hereford, the headquarters of the Green Cattle Company, the distance being about fourteen miles. A semi-weekly stage is run between these points. About two miles up the canyon there is a beautiful flower garden, the property of Mr. William Berner, and it affords excellent collecting. A small store is also kept in Ramsey Canyon, managed by the genial and able proprietor of the Hotel de Jack.

The Huachuca Mountains are still a fairly well wooded range, notwithstanding the onslaughts of the lumber hogs who thrived here before this region was declared a forest reserve. The higher parts are covered by various conifers, including six species of pines, *Pinus arizonica*, *P. ponderosa*, *P. strobiformis*, *P. cembroides*, *P. maryiana*, and *P. chihuchuana*. Along the streams grow various maples, alders, ash, walnuts, madrones, and the splendid Arizona sycamore (*Platanus wrightii* Watson.) Eight species of oak are found here, these being *Q. hypoleuca*, *Q. chrysolepis*, *Q. emoryi*, *Q. reticulata*, *Q. arizona*, *Q. gambelii*, *Q. oblongifolia* and *Q. undulata*. The latter is a scrub oak and occurs in extensive grooves, particu-

larly about the foothills. Among other trees that might be mentioned are the Douglass spruce (*Pseudotsuga mucronata* Sudworth); one seed juniper (*Juniperus monosperma* Sargent); alligator juniper *J. pachyphloea* Torrey); four willows, *S. nigra* Marshall, *S. occidentalis longipes* Beff, *S. lasiolepis* Benth, *S. tarifolia* Humboldt, Bonpland and Kunth; the quaking asp (*Populus tremuloides* Michaux), and another *Populus*, the beautiful Fremont cottonwood (*P. fremontii* Watson); two species of Hackberry (*C. occidentalis* Linnaeus, and *C. reticulata* Torrey); the Mexican mulberry (*Morus celtidifolia* Humb., Bonpland and Kunth), and two mahoganies (*C. parvifolius betuloides* Sargent, and *C. p. paucidentatus* Watson); the Mexican cherry (*Prunus salicifolia* Humb., Bonpland and Kunth); Devil's claws (*Acacia greggi* Gray), and *A. constricta* Benth; New Mexican locust (*Robinia neomexicana* Gray), hoptree (*Ptelea trifoliata* Linnaeus), wild china tree (*Sapindus marginatus* Wildenow), Mexican elder (*Sambucus mexicana* Preal.) There are many mescals and a few yuccas about the foothills, and both of these, when in blossom, attract innumerable insects and are of the greatest value to the lepidopterist, dipterist and hymenopterist. Along the water courses the gnarled manzanita, *A. pungens* H. B. and K., grows in profusion. There are a few clusters of mesquite, *Prosopis glandulosa* Torrey, at the base of the mountains and on these there is excellent collecting, especially when in bloom.

For the lepidopterist, August is the earliest month in which to visit the mountains, collecting from then on being at its best. While a number of single-brooded species will be missed, yet the richness of the fall months more than make up the deficit. Arizona having two so-called rainy seasons—winter and summer—there is but little collecting save in the months immediately following these. The summer rains generally begin in early July, and sometimes continue considerably into September.

The water question in the Huachucas, while not a serious one, is worthy of some consideration. A canteen will prove to be a very useful article. Moreover a small calibre rifle or re-

volver should be part of the collector's paraphernalia, as the little hydrophobia skunk seems to be particularly partial to entomologists—and his visits are largely nocturnal. Tin boxes should be used in packing specimens, as they not only safeguard the contents from the ravages of ants, but also to a considerable degree are mouldproof. For night collecting, an acetylene lamp is quite indispensable. Sugaring I have found to be highly unproductive.

Notes on a few Nymphs of Agrioninae (Order Odonata) of the Hagen Collection.

By JAMES G. NEEDHAM, Cornell University, Ithaca, N. Y.

(Plate XI.)

Supplemental to the descriptions and figures of nymphs of Calopteryginae that were published in ENTOMOLOGICAL NEWS for March, 1911, I present herewith some descriptive notes and drawings of three nymphs of Agrioninae. The species are from India. The specimens are in the Museum of Comparative Zoology, where I studied them in 1905. Although long in Dr. Hagen's possession they were not described by him. They present some peculiarities of structure that will be of special interest and value when the primary subdivisions of the subfamilies of Zygoptera shall come to be accurately defined.

Legion Podagrion s. lat. gen. ? sp. ? (Plate XI, figs. 1-4).

A few poorly preserved specimens of this species bear the M. C. Z. number 334.

A well-grown nymph measures; in length, 28 mm.; gills, 7 mm. additional; abdomen, 21 mm.; hind femur, 5 mm. Width of head, 5 mm.; of abdomen, 3.5 mm.

A smooth and rather slender species with long abdomen and rather short legs. Head widest across the middle of the large, laterally prominent eyes, which cover two-thirds of its side margins. Hind angles low, broadly rounded, subspinulose; between them the hind margin is deeply notched. Ocelli large, close together. Antennae about as long as the head is wide, the length of the several segments from the base outward is as 1 : 1.3 : 2.1 : 1.7 : 1.3 : 1 : .6. Labium elongate slender, the hinge reaching posteriorly to the

metathorax; mentum widened to the bases of the rather short lateral lobes; median lobe somewhat prominent, completely divided by a nearly closed median cleft which descends below the level of the base of the lateral lobes and widens at the bottom to an oval enclosure. Lateral lobe with a long and strong movable hook, and two stout incurved hooks on the end, the outer hook being simple and half as large as the inner. No raptorial setae.

Legs short, longitudinally carinate, the carinae beset with minute prickles. Wings reaching the base of the fourth abdominal segment.

Abdomen cylindric, becoming compressed and slightly narrowed on segments 9 and 10, with a dorsal ridge on 10, slightly excavate at the apical margin. Segments 5-9 are laterally carinate, the carinae spinulose serrate, ending in sharp lateral spines, the one on segment 5 rudimentary. Gills obovate, widest beyond the middle, and abruptly rounded on tip, each jointed on a distinct basal segment that is about as long as high, the middle gill about a tenth shorter than the other two. External genitalia of both sexes remarkably well developed.

The identity of this nymph is not disclosed by the imperfectly preserved venation. Ante and post-nodals are 2:16 and 2:14 in fore and hind wing respectively. The hind margin appears to be "petiolate" from the level of the cross vein opposite the inner end of the subquadrangle, although this is not very clear. The stigma is nearly four times as long as wide, slightly convex both before and behind, strongly braced at its inner end, and there are two cross veins in the space behind it, placed at the first and second thirds of its length. Vein M₂ arises opposite the fourth cross vein beyond the nodus, is widely separated from vein M₁ opposite the outer end of the stigma with four cell rows between (three of them below vein M_{1a}) and strongly convergent with vein M₁ to the wing margin. In the apical costal space beyond the stigma there are about ten long simple cross veins in the fore wing, and somewhat fewer, distinctly forking ones in the hind wing. The arculus is in line with the second antenodal cross vein, but inclines outward to meet the inner angle of the rather obliquely placed quadrangle. The latter is trapezoidal, its front margin much shorter than the others, being about half as long as the outer side and hardly more than a third as long as the hinder side. The branches of the cubital vein diverge strongly at their departure from the quadrangle, and then extend parallel.

These details should be sufficient for the determination of the genus at least, if one had before him representatives of the Indian fauna. I know no adult Agrionid with venation

of the sort described. The reference is made to the legion Podagrion of de Selys, because of the existence of two interpolated sectors (one long and one short) between veins M_3 and Rs, with a number of short oblique ones behind the tip of vein M_3 .

Pseudagrion sp. ? (supposition), (Plate XI, figs. 5-8).

Nymphs are in the M. C. Z. collection bearing numbers 327 and 355, collected by Rev. M. A. Carleton, in the Himalayas, in 1871.

A well grown nymph measures 19 mm., gills 6 mm. additional; abdomen, 14 mm. Width of head, 3.2 mm.

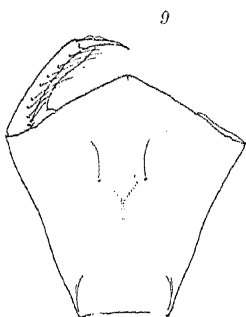
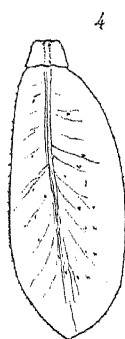
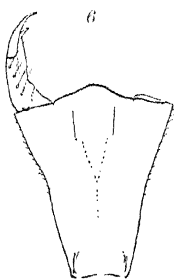
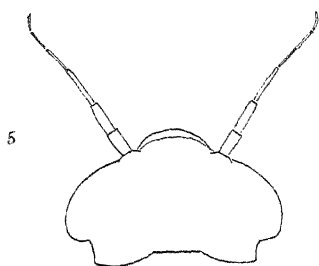
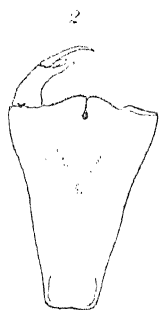
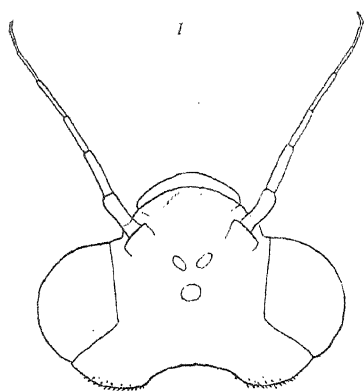
A rather slender nymph, readily recognized by the extreme angulation of the hind angles of the head, and by the conspicuous joint in the middle of the gills. The head save for the hind angles, is of the ordinary Agrionine form, with ocelli close together upon the middle of the dorsal side. The antennae are apparently but six jointed, the relative lengths of the joints being as 1: .9: 1.1: 1.2: .9: .7. Legs slender. The wing cases reach the middle of the fourth abdominal segment. Vein M_2 arises opposite the fifth cross vein after the nodus in the fore wing, opposite the fourth cross vein in the hind wing. There are no interpolated sectors save M_{1a} which arises in the hind wing opposite the base of the brace vein to the stigma. The hind side of the stigma is shorter than the cell behind it. The front side of the quadrangle is in the fore wing about equal in length to the inner end, but much longer in the hind wing. The gills are divergent basally, distinctly divided into two segments by an oblique suture at the middle of their length, and thereafter parallel to their rather obtuse tips. In a wide transparent marginal area there are small pigmentation figures of more or less dendritic form, and the denser more opaque median band is traversed by long and nearly parallel tracheal branches, which gradually diverge to the margins.

Acigrion sp. ? (supposition), (Plate XI, figs. 9, 10).

Nymphs of this species in the Museum of Comparative Zoology bear the numbers 395 ("Swamp, E. Jumma, India. Old Holy Tank"), and 324 ("Ibania, East India. Old Holy Tank"). They are interesting as showing a minimum development of the median cleft of the labium.

A well grown specimen measures: in length, 12.5 mm., gills 3.5 mm. additional; abdomen, 7.5 mm.; hind femur, 3 mm. Width of head, 3 mm., of abdomen 2 mm.

A not very slender nymph with short gills. Head rather deeply



AGRIONINE NYMPHS—NEEDHAM.

and squarely notched behind between wide hind angles that are obtusely rounded externally and beset with minute prickles or tuberculations. Antennæ seven-jointed, the relative length of the segments being as 1 : 1.6 : 2 : 1.9 : 1.6 : 1.2 : .6.

The legs are short and rather stout with spinulous longitudinal carinae. The femora show indistinct subapical rings of paler coloration. The wing-cases reach the middle of the fourth abdominal segment. Abdomen rather short, cylindric, slightly tapering posteriorly, with a row of pale dots across the apical border of each segment. Gills oval, widest just beyond the middle, tapering to both ends, but more abruptly to the submucronate apex. They are without the middle transverse suture of the preceding species, but they retain the chitinized margins bearing minute serratures and spinules in something less than the basal half of the dorsal margin of the superior gill and of the ventral margin of the paired gills. The tracheal branches are all long. They issue separately near the base and gradually diverge as they pass outward along the axial thickening of the gill.

• The genitalia are well marked in both sexes. The ovipositor of the female is large, its supporting valves bear on the ventral margin several spinules and have a thorn-like decurved apex. The ninth segment in the male is armed ventrally with two sharp pyramidal triangular spines.

I have ventured to publish these brief descriptions for the purpose of calling attention to the cleft condition of the labium in two true Agrioninae. Also, for the purpose of calling attention to the almost untouched problem of the segmentation of the caudal gills which the three forms herewith described present. The first of these has gills with a short basal segment, something as in *Lestes*. The second has a distinct joint in the middle of the gill. The third has lost the middle suture, but has retained a slight differentiation of the margin of the basal portion, as have some other well known agrionine nymphs.

Explanation of Plate XI.—Figures 1 to 4, unknown nymph of the legion Podagrion. 1—The head from above. 2—The labium from within. 3—The lateral lobe of the same. 4—A single caudal gill.

Figures 5 to 8—*Pseudagrion* (supposition). 5—The head from above. 6—The labium from within. 7—The lateral lobe of the same. 8—The end of the abdomen of the male nymph, showing gills.

Figures 9 and 10—*Aciagrion* (supposition). 9—The labium from within. 10—The lateral lobe of the labium of the same.

A New Root Gall Midge from *Smilacina* (Dipt.).

By SHERMAN C. BISHOP, Clyde, New York.

Dasyneura smilacinae n. sp.

The insect described below was reared by me at Ithaca, New York, January 15, 1910, from root galls on false Solomon's Seal, *Smilacina racemosa*.

Female.—Length 1.5 to 2.5 mm. Face, light yellow, slightly darker at apex; labrum, yellow, somewhat darker at tip and fringed on its free margin with fine hairs. Antennæ, dark brown; 17 sessile segments, extending to second abdominal segment; basal segment, goblet shaped; second, globular and inserted in hollow of first; first two and basal half of third segments lighter in color than remaining segments; the fifth cylindric, with a length about twice its diameter; subbasal whorl sparse, subapical whorl long, scattering; terminal segment narrowly conical, with a length three times its diameter and tapering rather abruptly from the distal third. Palpi quadriarticulate, first segment subquadrate, the second rectangular with a length three times its diameter, the third one-half longer, more slender; the fourth longer and more slender than the third.

Pro- and meso-thorax marked dorsally with three dark brown longitudinally extending spots, placed side by side, with center one slightly cephalad. Center spot rounded in front, tapering to a point behind. Outer spots roughly crescent shaped, with convex sides placed towards the center.

Abdomen light yellow or white, covered dorsally with brown scales, forming broad but somewhat indistinct bands. Posterior margins of segments fringed with long yellow hairs. Ovipositor, fully extended, about three-fourths as long as body; terminal lobes with a length four to five times their width, slightly tapering, thickly setose; minor lobes short.

Wings hyaline covered sparsely with long light brown hairs; subcosta uniting with costa at the basal third; the third vein slightly curved and joining the margin at the distal ninth; the fifth at the distal fourth, its branch just before the basal half; costa thickly clothed with brown hairs and a few elongated scales.

Halteres with stalk transparent and knob light brown or with an opaque spot.

Legs, light straw, sparsely covered with short light brown hairs. Tarsi somewhat darker; first two segments as long as last three; claws slender, strongly curved, unidentate, the pulvilli a little shorter than the claws.

Male.—Length, 1 mm. Antennæ probably with 17 segments, the fifth with a stem about one-third the length of the cylindric basal enlargement, which latter has a length twice its diameter. Stalks of segments lighter in color than basal enlargements. Other characters of male indistinct, the one specimen being in very bad condition.

The Probable Occurrence of the Mymarid Genus *Dicopus* Enock in North America (Hymen.).

By A. A. GIRAULT, Brisbane, Queensland, Australia.

Several weeks ago, Dr. C. Gordon Hewitt, Dominion Entomologist, Ottawa, Canada, turned over to me for identification a number of slide-mounted parasitic Hymenoptera obtained from spruce budworm rearing material, among which I found a single mymarid so minute as almost to be lost in the medium in which it was mounted. Casually, I placed it at once as an *Alaptus* but more leisurely examination showed that it differed from that genus in having two more segments in the antennæ. This being the case, the species could not be placed into any of the genera of the Gonatocerinae, since there are none in that sub-family which bear twelve-jointed antennæ in the males. There is an English genus, however, recently described by Enock for *Dicopus minutissima* Enock, which closely resembles *Alaptus* Haliday in form, but which differs in bearing two more antennal segments; the male of this genus is unknown. Now, this Canadian species precluded from being an *Alaptus* must belong to *Dicopus*, at least until we know to the contrary. It is one of the smallest North American Mymaridæ and because of this and also because of its characteristic appearance, I believe it incumbent on me to describe it rather than risk its being lost. It can be easily recognized; thus, it is an *Alaptus* male with two more segments in the antennæ, the antennal funicle peculiar because of the abrupt narrowing of the second joint and the fore wings more or less characteristic by reason of their comparatively abundant discal ciliation. I describe the species in detail herewith.

Family Mymaridae, Subfamily Gonatocerinae, Tribe Gonatocerini, Genus *Dicopus* Enock.

1. *Dicopus halitus* new species.

Normal position.

Male.—Length, 0.23 mm. Very minute, barely visible to the naked eye as a fleck of dust. Abdomen sessile; tarsi 5-jointed.

General color sooty black, all of the legs and the whole of the antennæ pallid yellowish; wings very slightly clouded throughout, the

margins of the fore wings distad rimmed with yellowish. Eyes dark reddish.

With all of the characters of *Alaptus* Haliday, male, but the antennæ 12-jointed; resembling an *Alaptus*. However, the fore wing is slenderer at that portion just distad of the venation and the caudal wings are as narrow as it is possible for them to be and still have a blade, narrower by a half than those of *Alaptus*. Fore wings shaped as in *Alaptus*, their marginal cilia long and slender, the longest at and around the apex where they are four or more times longer than the wing is wide just before apex (its widest portion), the cilia symmetrical along each margin, those around the dilated apical portion of the blade colorless a short distance out from their insertions, making the usual colorless path which follows the outlines of the margins of the apex. Blade of the fore wing characterized by bearing in the dilated portion (distal half or less) a single midlongitudinal paired line of short discal cilia and a single line of the same along each margin, all three lines about equal in length. Venation as in *Alaptus* and the wing has the usual dilated portion proximad, along the caudal margin. Caudal wings very narrow and nearly straight but slightly widening distad, their marginal cilia long, the longest (at apex) about half the length of the longest of the fore wing, present farther proximad along the caudal margin of the blade; the blade of the posterior wing bearing along the distal half or less, at each margin, a single line of discal cilia, distinct but short; no discal cilia in the midlongitudinal line of the posterior wing. All tarsal joints short, the proximal one longest, the tibial spurs single, minute, straight. Legs simple, slender, but of the usual length.

Antennæ 12-jointed, filiform as in male *Alaptus*; characterized by having the second funicle joint abruptly narrower and slightly shorter than the first, somewhat as the case with *Alaptus iceryae* Riley but the joint is slenderer and longer than wide; scape and pedicel short, the latter widest of all segments; funicle 1 shorter and much narrower than the pedicel; 2 abruptly narrower and slightly shorter than 1, a half shorter than 3 which is also distinctly broader; 4 and 5 subequal, each a fourth shorter than 3, each longer than 1; 6, 7, 8 and 9 subequal, each slightly longer than the one preceding. 6 subequal to 3, 9 longest of the flagellum. Joint 10 or the club conical, subequal to 4. All flagellar segments distinctly longer than wide. Pubescence sparse and minute. (From 1 specimen, 2-3 inch objective, 1-inch optic, Bausch and Lomb.)

Female.—Unknown.

Described from a single male specimen on a slide in balsam received for identification from Dr. C. Gordon Hewitt, Dominion Entomologist, Ottawa, Canada, the slide being labelled

"Ex. Spruce budworm material, Maniwaki, P. Q., 27 VI. '11 Division of Entomology." The supposed host is *Tortrix fumiferana* Clemens, but of course the record is doubtful; I would suggest, instead, a psocid egg or a coccid pupa present in the host material.

Habitat.—Canada—Quebec (Maniwaki), G. E. Sanders.

Host.—Unknown.

Type.—Cat. No. 14,184, United States National Museum, Washington, D. C., one male in balsam.

Notes on Two Tipulidae (Dipt.).

By CHARLES P. ALEXANDER, Ithaca, N. Y.

The following species were taken in Fulton County, New York, during 1909 and 1910. The first species is a novelty and cannot be referred to any of the known genera of crane flies. After a careful examination of the literature, I have decided to erect the following genus:

SACANDAGA gen. nov.

Subcosta, long; vein R^2 very short, oblique; no radial cross-vein; M_1+2 fused to margin. Antennae of 16 segments; basal segment rather globular; second globular, cyathiform;

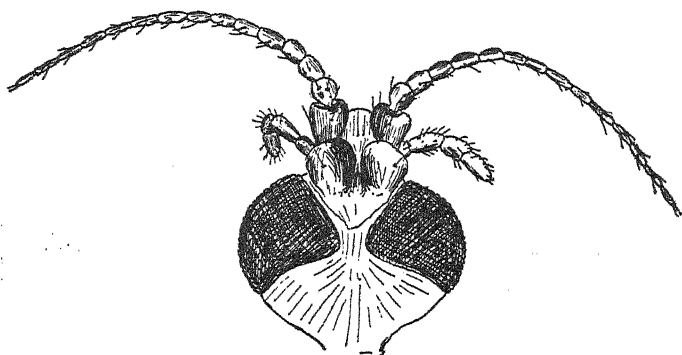


Fig. 1.—*Sacandaga flava* dorsal aspect of head; Cotype No. 2.

first segment of the flagellum globular; second to ninth gradually cylindrical; tenth to fourteenth, elongate-cylindrical; all

of the segments of the flagellum armed with from two to four stiff hairs. Palpus of four segments; fourth segment irregularly cylindrical, longer than the third; second about as long as the fourth; first longest; all armed with many stiff hairs. Eyes large, rather approximated behind. Legs rather short, fore legs about 13.5 mm. long; middle, 10.5 mm. long; hind, 13.5 mm. long. Last four tarsal segments very slender at their point of attachment with the segment preceding. The last tarsal joint is small, irregular in shape, rather smooth on the outer face; inner face, concave, with slight convexities at each end, the proximal with from six to eight hairs, the distal one with a single conspicuous bristle on each side, the whole inner face being rather finely clothed with hair; at the base of the segment on the outer face, are about four stiff hairs. Penultimate segment generally similar to the fifth in shape and

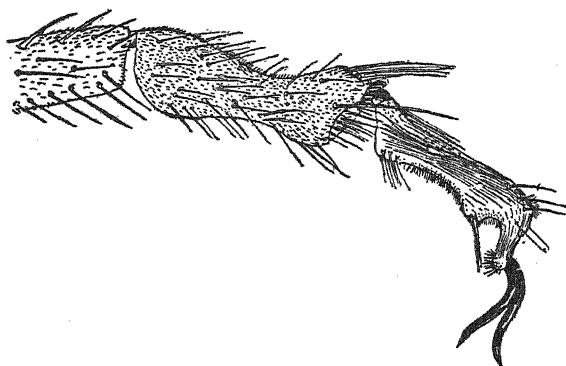


Fig. 2.—*Sacandaga flava*—middle leg, showing last two tarsal segments.

size, but more thickly covered with stout hairs. Claws long, slender, smooth, those of the posterior legs nearly two-thirds as long as the fifth tarsal segment.

This genus belongs to the tribe *Polymedini* (*Eriopterini* of authors.) It is most similar in venation to *Empeda* and *Goniomyia*, which it approaches in the shape of cell R^2 . It is easily distinguished by the much greater length of subcosta, lack of radial cross-vein, the deflection of Cu^1 fusing with M^8

under cell first M^2 (discal cell of Osten Sacken), not proximal to it, and the consequent insignificant fusion of Cu^1 with M^2 . The resemblance to these two genera is probably merely accidental, as, in general appearance, the flies are very different.

The type, and only known species, is:

***Sacandaga flava* sp. nov.**

Type—Alcoholic ♀, in C. U. collection; Sport Is., Sacandaga River, June 12, '09. Cotypes; (1) Sport Island, July 5, '09 (collection Bost. Soc. Nat. Hist.). (2), ♂; June 27, '10; same locality. (3), ♂; June 12, '09; same locality. (4), Gloversville, N. Y., July 3, '09.

Length 5 mm.; wing, from 6 to 7 mm. See table of leg measurements at the end of description.

Antennæ blackish-brown; first segment, head and palpi, reddish-brown; eyes black.

Thoracic dorsum with a broad median stripe of reddish-brown on a more yellowish ground, beginning on the anterior margin of the præscutum, terminating within a short distance of the posterior margin. To the side of this, and more or less distinctly separated from it, is a broad stripe, beginning near the caudal end of the scutum and extending forwards on the side of the præscutum to near the middle of the latter. A narrow brown stripe extends from the anterior margin of the præscutum to the cephalic margin of the neck. Sides of the neck and thorax, honey-yellow, becoming infuscated toward the venter. Legs dusky yellow; halteres light yellow throughout. Abdomen dirty yellowish. Wings hyaline, opalescent; stigma somewhat distinct.

Details of venation of the species: Subcosta long, Sc_1 at least five times the length of Sc_2 . Radius quite long, parallel to subcosta till the latter ends, and then parallel to costa for a short distance, at its tip sharply turned upward. The radial sector arises near the middle of R . R_2 is very short, oblique, shorter than the cross-vein $r-m$ and only one quarter the length of R_3 . R_3 a trifle longer than R_2+3 . Basal deflection of R_4+5 as long as R_2 ; beyond the $r-m$ cross-vein, the vein runs nearly parallel between R_2+3 and M_1+2 .

Media: basal deflection of M_1+2 about one-half the length of R_2 ; thence, to the m cross-vein, twice the length of R_2 . Basal deflection of M_3 equals R_2 . Fused portion of M_3+C_{u1} equal to one and one-half R_2 . Second deflection of M_3 , two-thirds the length of R_2 .

Cubitus: Basal deflection of *Cu1* (great cross-vein of Osten Sacken) two-thirds the length of *Cu2* or one and one-half *R2*.

1st Anal, nearly parallel to cubitus, more divergent toward the wing-margin. 2nd Anal, gently bisinuate and diverging posteriorly, leaving cell 1st *A* very large.

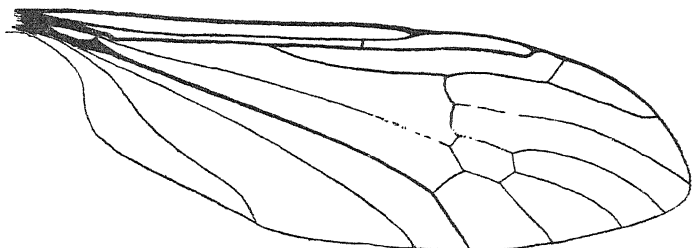


Fig. 3.—*Sacandaga flava*—wing; Cotype No. 3.

Cell *R2* is triangular, small; cell 1st *M2* (discal cell of Osten Sacken) hexagonal, small. The proportions of the veins holds good in the specimens examined but may vary somewhat in a large series.

Leg measurements of cotype No. 2 (♂):

	FORE	MIDDLE	HIND
Femora	3.6 mm.	3.6 mm.	4.9 mm.
Tibia	4.8 "	3.7 "	4.5 "
Tarsus.....1	3.3 "	2.0 "	2.35 "
"2	1.0 "	.75 "	.90 "
"3	.3 "	.28 "	.35 "
"4	.14 "	.14 "	.14 "
"5	.13 "	.13 "	.13 "
Total.....	13.27 mm.	10.60 mm.	13.27 mm.

More complete notes on the habits and occurrence will be given in "Fulton Co. (New York) Tipulidæ; Pt. II."

Adelphomyia senilis.

A second species which deserves mention is a little crane-fly of the tribe *Limnophilini*. It belongs to the genus *Adelphomyia*, hitherto known only from the Old World, and is undoubtedly the same as the common European, *A. senilis* Haliday. The specimens at hand, over a hundred in number, agree

so closely with Loew's detailed description (as *Cladura fuscula*, Besch. Europ. Dipt. III, p. 65), that it must be referred to *senilis* until a comparison with European specimens proves it otherwise.

The fly is very common in Fulton County, New York, in late summer and early autumn, and with the exception of the all-predominant *Cladura flavoferruginea* O. S., is the most common *Amphinomine* (*Limnophila*) at this season.

The venation, as shown by figure 4, is, in general, similar to a *Phylidorea* (*Limnophila*), but Sc^1 is longer than in any of the species of this genus in Eastern America, at least. All of the distal cells possess long prominent hairs on the membrane. These hairs occur all over cells 2nd R^1 , R^2 , R^3 , R^5 , M^1 , M^2 ,

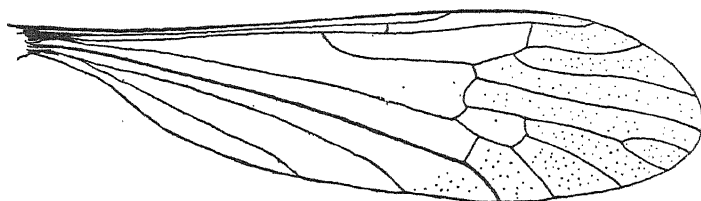


Fig. 4.—*Adelphomyia senilis*—wing.

M^3 , Cu^1 , a few in cell 2nd M^2 (discal cell of authors), and a few on the extreme distal edge of cells Cu , R and Sc^1 . There is never any of this hairiness on the proximal half of the wing as in *Ulomorpha* and the character of the hair is different in the two genera.

Adelphomyia senilis might be mistaken for a small *Phylidorea*, but it is smaller than any of the described Eastern species. From *Ulomorpha*, it readily separates by its smaller size, presence of cell M^1 and characters mentioned above.

In Fulton County, New York, the species is well distributed, as follows:

(1) Woodworth's Lake; alt. 1665 ft.; Aug. 21, 22, '09; Aug. 22, 1910.

(2) Sport Is.; Sacandaga R.; alt. 750 ft.; one only, Aug. 24, 1910.

(3) Johnstown; alt. 600 ft.; Aug. 31-Sept. 22, 1910.

(4) Gloversville; alt. 1000 ft.; Sept. 23, 1910.

Mr. M. D. Leonard, a most careful student of the family, took two specimens at Ridgewood, Bergen Co., N. J. (Brook, Ridgewood Heights, Sept. 16, 1910), thereby adding an interesting species to the New Jersey State list.

Besides receiving help from a number of students at Cornell, I wish, especially, to thank Dr. J. G. Needham for his very kind assistance throughout the course of this study.

Two Rare Species of Coleoptera.

BY HENRY SKINNER, M.D., Sc.D., Philadelphia, Pa.

I. DORCUS BREVIS SAY.

It seems of interest at this time to put on record in more concrete form a short history of this interesting beetle. It was described under the name of *Lucanus brevis* by Thomas Say in the Journal of the Academy of Natural Sciences of Philadelphia, Volume V, pt. 1, p. 202, 1825. No locality was mentioned other than the United States. The next mention of the species is probably by J. H. B. Bland, Proceedings of the Entomological Society of Philadelphia, 1, 263, 1862. He gives a brief account of the records of the species and a figure. Three specimens are mentioned as having been found within a few miles of each other in the months of July and August. The specimen figured, a male, was taken alive near Weymouth, New Jersey. This specimen is in the collection of the American Entomological Society. "Of the other two, one a female, is in the collection of Dr. Leconte [now Museum of Comparative Zoology, Cambridge, Massachusetts], the other, a male, is in Mr. Bland's collection, both being more or less imperfect." The specimen mentioned as being in Mr. Bland's collection passed into the hands of the late Charles Wilt and is now in the collection of the American Entomological Society. Mr. Bland stated that the species had been lost from our fauna since 1831. All the specimens were collected by G.

W. Quinn, two of them being found dead, lying in the open road. These two were found in the vicinity of Da Costa, Atlantic County, New Jersey.

It is not my purpose to say anything about the generic position or the specific value of this beetle; this has been done, however, by Dr. George H. Horn, in ENTOMOLOGICAL NEWS, 3, 73, 1892, under the title *Dorcus parellus* Say. I made the photograph for Dr. Horn and superintended the printing of the illustration accompanying his article. It is somewhat doubtful whether Dr. Horn's views will be acceded to by the Coleopterists of to-day. The annual report of the New Jersey State Museum, including a Report of the Insects of New Jersey for 1909, page 311, credits the species to Da Costa (Say) and Weymouth (Daecke). The locality whence Say received the species appears to be unknown and Daecke has never taken the species. Da Costa and vicinity have been the stamping ground of the Philadelphia entomologists for over half a century and none of them ever found a specimen of *Dorcus brevis*, with the exception of those above mentioned taken by G. W. Quinn, who lived at Da Costa. The locality where *brevis* was taken is a very wild one and is a good second in midsummer to the desert of Sahara. It has changed considerably since the early days. This part of Jersey is covered with scrub pine and oak, but the axe of the woodsman and forest fires have greatly changed things. Many of the old sand roads through the woods have been surfaced with gravel. Weymouth is about six miles southwest of Da Costa. I have collected at Da Costa on hot days and found it about as trying a place as I have ever been in. The lack of water and the heat reflected from the sand make a combination that only the enthusiastic entomological collector can stand.

The way to get *brevis* would be to spend a couple of months at Da Costa (July and August) and make a regular campaign for the insect. My interest in the species was brought about by a conversation with Mr. Henry W. Wenzel, who has known the locality for years and often collected there. He is also familiar with the early history of the species. The Bland family

lived in Da Costa at one time and G. W. Quinn was a brother-in-law of Bland and also lived there. If there are additional specimens (other than the three mentioned) it would be of interest to have them placed on record.

II. THE REDISCOVERY OF *PLUSIOTIS WOODII*.

This beautiful species was described by Dr. G. H. Horn in the Transactions of the American Entomological Society, 12, 124, 1885, and he speaks of it as follows:

"Two specimens from the Rio Grande, Texas, collected by my friend, Dr. H. C. Wood, to whom I have great pleasure in dedicating the species. I have seen another specimen in the Museum of the Jardin des Plantes at Paris."

When I described *Plusiotis beyeri* in ENTOMOLOGICAL NEWS 16, 289, 1905, I endeavored to find out the exact place where *woodii* was taken and wrote to Dr. Wood in regard to the matter. He said he believed the two specimens (male and female types) were taken either at El Paso or in the valley of the Tornillo Creek which runs into the "great bend" of the Rio Grande, Texas. Mr. H. W. Wenzel predicted that the home of *woodii* would be found to be somewhere in the mountains of southern Texas, and such proves to be the case. A number of specimens in beautiful condition have been obtained by the Wenzel-Green expedition to the Great Bend of the Rio Grande. These specimens were taken July 10th, 1911, on Davis Mountain, 5200 ft. altitude in Jeff Davis County, Texas. They were beaten from walnut trees. The specimens agree perfectly with the types in the Horn collection and show no variability and are very distinct from the other species in the genus. The expedition members are Mr. H. A. Wenzel, of Philadelphia, and Mr. J. W. Green, of Easton, Pennsylvania.

It is extremely interesting to have *Plusiotis woodii* refound after a period of twenty-six years. The collectors deserve great credit for their enterprise and they will doubtless find many other species of interest in this unexplored region. In addition to *woodii* they found *P. gloriosa*, which greatly extends the range of the latter species.

Four specimens of *woodii* were also taken in Moss Canyon in the Chisos Mountains. *P. gloriosa* was also found in these mountains.

Plusiotis beyeri has been found by Prof. H. A. Pilsbury at Agua Caliente, Santa Rita Mountains, Arizona (7000 ft.), and by J. R. Haskin, near Cananea, Sonora, Mexico (5000 ft.)

Description of a New Dryophanta (Hymen.).

By WILLIAM BEUTENMULLER,

American Museum of Natural History, New York City.

Dryophanta pulchella sp. nov.

Female.—Head rufous or pitchy brown, finely punctate, median ridge rather broad. Antennæ 14-jointed, dark brown, first and second joints yellowish brown. Thorax dark reddish brown or black, smooth and shining. Parapsidal grooves sharply defined with the margins rounded; they are widely separated anteriorly and very close together at the scutellum. Median groove broad anteriorly and gradually becoming narrower and very fine at the scutellum. Anterior parallel lines and lateral grooves wanting. Pleurae punctate with a large, smooth, glossy area. Scutellum dark rufous or black, rugose, with two large depressions or foveæ at the base, separated by a fine carina. Abdomen rufous, smooth and shining. Legs rufous. Wing long, hyaline with a number of large brown clouds and patches of different sizes. Veins heavy, brown and infuscated. Areolot small, Cubitus continuous to the first cross-vein. Radial area open, radial vein curved and running outwardly for a short distance below the costal margin. Length, 3—3.50 mm.

Habitat: Catalina Island, California, (C. F. Baker); Hood River, Oregon. June 20th.

In the specimen from Oregon the thorax is black, otherwise it does not differ from the form with the red thorax. It is a beautiful species and may be readily known by the large spots and cloud on the fore wings. The male and gall are unknown.

LIEUT. COL. WIRT ROBINSON, Coast Artillery, has been nominated by the President of the U. S. to be Professor of Chemistry at West Point, to take effect on October 3rd. Colonel Robinson is interested in Ornithology and Entomology. He was the discoverer of the home of *Papilo homerus* in the Cuna Cuna Pass in the Blue Mountains of Jamaica. His interesting article on his experiences in search of this large and rare species was published in the News.

A New *Polynema* from Mexico (Hymen.).

By A. A. GIRAULT, Brisbane, Queensland, Australia.

The following species was found in a collection of Signiphorinae loaned to me for study by Dr. L. O. Howard. It was at first identified as *Polynema howardii* (Ashmead) but a comparison with the type of the latter shows such differences that the two cannot very well be the same.

Polynema aspidiotti sp. n.

Normal position. *Male*.—Length, 0.65 mm. Moderate in size for the genus.

Similar to *howardii* but differing in the following details:

The fore wings differ somewhat in shape but more specifically in having shorter marginal cilia at the wing apex and along the cephalic wing margin; in *howardii* the apical margin cilia and those along the cephalic margin are twice longer than with this species, nearly as long as half the greatest wing width; in *aspidiotti*, however, they are only about a fourth the greatest wing width; the fore wing is shaped still more like that characteristic of *Stethynium* Enoch. The species differ in coloration: in *howardii* all of the legs are black or nearly so, but in *aspidiotti* the first two pairs of legs are pallid yellowish, only slightly dusky in places, the distal tarsal joints blackish, while, excepting the trochanters, all of the posterior legs are blackish; in *howardii* only the proximal three tarsal joints of all of the legs are yellowish; in *aspidiotti* all of the tarsal joints of the caudal legs are black. Otherwise the two species are identical. The line of foveæ across the scutellum is present here; the parapsidal furrows are complete; all of the antenna concolorous with the body; petiole of abdomen yellowish; joints of flagellum short, slightly more than twice longer than wide.

From one specimen, 2-3 inch objective, 1 inch optic, Bausch and Lomb.

Female.—Unknown.

A species characterized by the shape of the fore wing and the arrangement of its marginal cilia.

Described from a single male specimen mounted on a slide with a species of *Signiphora* and labelled "1734. *Aspidiotus carinatus*. On Lime, Cuautla, Morelos, Mex., July 2, '97. Koebele." The host may be the *Aspidiotus* or else some Jassid egg.

Habitat: North America—Mexico (Morelos).

Type: Type No. 14,027, United States National Museum, Washington, D. C., one female in balsam.

Early Stages of *Lycaena lygdamus* Doubleday (Lepid.).

By H. M. BOWER, Chicago.

(Plate XII.)

On May 14th while collecting at Palos Park, a small town about twenty miles southwest of Chicago, it was my good fortune to observe a female *lygdamus* ovipositing on *Lathyrus ochroleucus* Hook. and *L. caroliniana* Walt. which grew abundantly on a particular knoll in that vicinity. Upon further search many eggs were found and a few larvae.

The eggs in most cases, were laid on the outside of the tender leaf buds, though one was occasionally found on the under side of the older leaves. Upon hatching the young larvae ate small holes in the tender leaves and leaf buds. In the former case they would sometimes bore through the leaf and remain within the cylinder of the curled leaf. The buds were simply bored into until the third or fourth segment was out of sight when the hole was abandoned and another started. These tender leaves and the leaf buds were preferred throughout the life of the larvae.

Having occasion to visit this place later for food, I found a number of the more mature larvae. These were in almost every case attended by several ants which made the search rather easy as the ants invariably led to the discovery of a larva.

Several cases of cannibalism were observed in raising the larvae. Though supplied with abundant food some larvae partially consumed others which were moulting.

Before entering into the detailed description I wish to express my appreciation of the kindness of Mr. W. J. Gerhard, of the Field Museum who, among other things, took me to the haunts of *lygdamus*, which appears to be quite local.

Egg.—Length .70 mm.; height .30 mm. Turban-shaped with micropyle slightly depressed. Color, when fresh, pale green, turning dull white before hatching. There is a raised white network forming polygonal cells. At the angle of each cell there is a rounded protuberance. The latter are largest at the edge of the egg and grow smaller at the base and around the micropyle. The cells formed

by the network are of various shapes, triangles predominate though crude squares and diamonds are present especially around the micropyle. Incubation period— $3\frac{1}{2}$ to 4 days. The larvae emerged by eating the shell at the top but in no case more than sufficient to get out.

Young larva.—Length, 1 mm.; slug-shaped. Color, light brown. Head, black. Feet, dark brown. There is a row of small tubercles on each side of the dorsal line, one on each segment, which bears a long hair, brown at the base but growing lighter at the tip, and pointing slightly backward on segments 2 to 11 inclusive, forward on the first segment. A little below and posterior to this row, each of segments 1 to 9 bears another hair which, with the exception of those on segments 1 and 2, bends abruptly backward and is shorter than the first described hair. On segments 1 and 2 they are of about equal length and point forward, especially on the first segment. The lateral line, marked by minute hairs at the forward edge of each segment is present on segments 2 to 10 inclusive.

The substigmatal line is light brown, raised and has three dark tubercles on each segment, the middle one being lower down in the line than that on either side. Each bears one hair, the middle one being the longest.

The cervical shield is dotted with black. Prolegs light brown, each bearing one small hair. The last segment has a number of small hairs around the edge. Spiracles, dark brown.

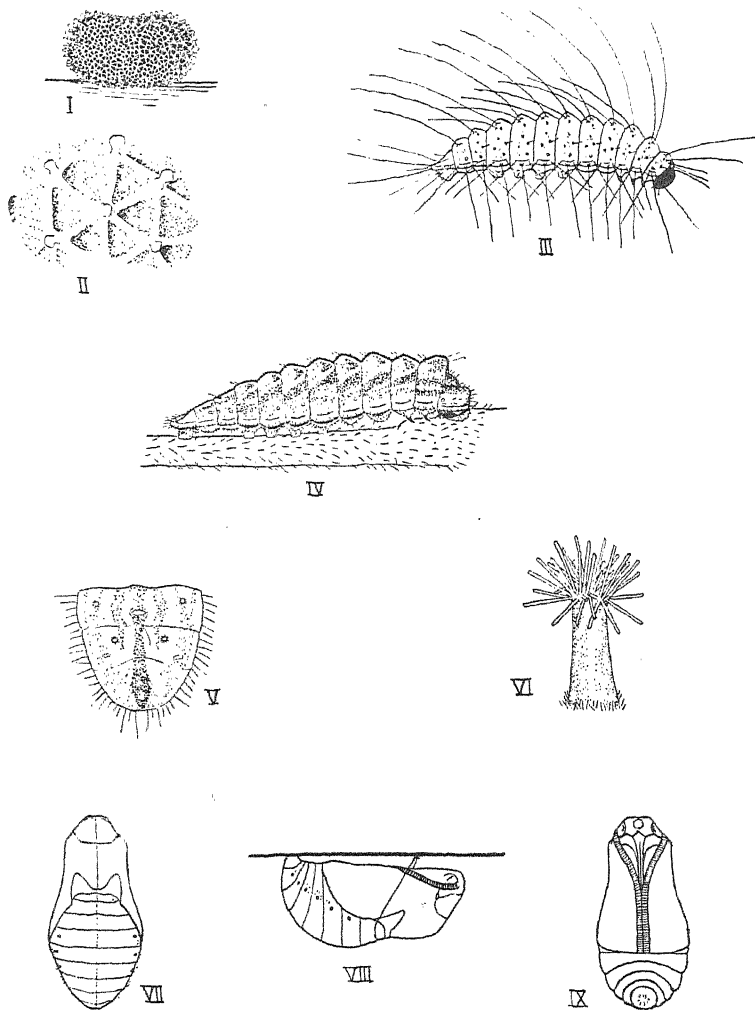
Each segment is slightly depressed vertically in the center and has several minute dots; one slightly below, and one on, the lateral line, and two others, one above the other toward the dorsum.

As the larva grows older, the color becomes light green, dorsal line dark green, with a light line on either side. Substigmatal line, light green. Head toward the end of this stage is hidden by the first segment which is carried horizontally.

Time between hatching and the first moult—4 days.

After first moult.—Length 3 mm. Feet and head black. Body pale green. The first segment is carried horizontally and is covered with small colorless hairs pointing forward. Segments 2 to 9 and segment 11 bear each one long hair pointing backward, and set in a small light green tubercle on each side of the dorsal line. There are also numerous smaller hairs scattered over the dorsum. In the middle of the 10th segment there is a gland opening at right angles to the dorsal line. It is the secretion of this gland that is attractive to the ants. The last segment is edged with short hairs.

The raised substigmatal line is yellow-green and is fringed with small colorless hairs, the three of the preceding stage being prominent. Sutures, dark green.



LYCAENA LYGDAMUS—BOWER.

The cervical shield, in the shape of a curved triangle with the base forward, is light green spotted with black.

Spiracles dark brown.

The dorsal line is dark green edged on each side with yellow green, the edging being most prominent in the middle of each segment. Starting from the light edging of the dorsal line a yellow line runs obliquely from the front of each segment and is continued on the succeeding segment as a broken sublateral line. On the first two segments this line is fainter, appearing as a sublateral line only. In some specimens these obliques were not evident until later in this stage.

The middle of the first ten segments is slightly depressed. The body is covered with small hairs. Venter green.

Some larvæ are green overshot with brown. Dorsal line deep claret. Style of markings the same.

Time in this stage—5 days.

After second moult.—Length, 4 mm. Color, yellow green. Legs and head black. Dorsal line, dark green, widest on the second segment and gradually growing narrower, edged on each side with yellow green. Substigmatal line raised, yellow, and fringed with hairs as before. Cervical shield, pale brown edged with dark green and spotted with black. First segment covered with short, white hairs. Segment 2 bears two long hairs on each side of the dorsal line. Segments 3 to 9 inclusive bear each one long hair on each side of the dorsal line, set in a colorless tubercle. The 11th segment bears one long hair on the dorsal line.

The oblique lines are definite yellowish stripes starting with the light edging of the dorsal line at the anterior part of one segment, cross the segment and appear on the succeeding segment. They are broadly edged below with dark green. These obliques are faint on segment 3 and appear on the second segment as a sublateral line only, edged above and below with dark green. Segments 10 and 11 are marked by a continuation of the obliques of segment 9.

The tenth segment has the gland as in the preceding stage and on the 11th segment below and behind both spiracles are eversible organs. When retracted they leave small, oval, light colored patches; everted they are white columns crowned with movable straight projections.

Duration of this stage—4 days.

After third moult.—Length, about 8 mm. Color, clear green. Markings as in the preceding stage but much more pronounced, especially the dorsal oblique with its wide dark green edging below. Substigmatal line the most conspicuous mark, cream colored, edged above and below in the middle of each segment with dark green.

Cervical shield pale brown with black spots, edged on the sides with a continuation of the dark upper edging of the sublateral line. Principal hairs located as in the previous stage. Gland and eversible organs as before.

Duration of this stage—4 days.

After fourth moult.—Length of mature larva, 14 mm. Greatest width (9th and 10th segments) 4 mm. Greatest height (3rd to 5th segments) 3.50 mm. Slug-shaped. Color, light green. Head and feet black. Body granulated with white points. Cervical shield light brown spotted with minute short black spines terminating in a star-shaped process. Dorsal line dark green, interrupted by the cervical shield but appearing on the first segment, which is carried horizontally.

The dorsal line is edged on each side with light yellow green. There is a short hair on segments 2 to 9 inclusive on each side of the dorsal line toward the rear of each segment. Segment 10 has one hair on the dorsal line behind the gland. Segment 2 also has one on each side of the dorsal line on the anterior part of the segment. Segment 1 has many hairs indiscriminately placed.

The oblique markings are as in the previous stage and very prominent. Substigmatal line as before, edged with hairs of even length as is also the case in the preceding stage.

Subventral line—a trace, light yellow green bearing short hairs. Spiracles round, clear, surrounded with minute erect brown hairs. Venter, clear green. Prolegs green.

Segment 10 bears the oval sac as before. The eversible organs present on the 11th segment.

As the time for pupation draws near the larvae turn blue green.

The above is a description of the average larva. In some cases the dorsal line is dark brown, in others deep wine-colored. In one instance the color of the dorsal line was suffused over the top of the second and third segments giving them a rose color. The type of the markings is, however, constant.

Time in this stage—5 to 6 days.

The larvae in almost every instance pupated in the bottom of the receptacle suspending themselves under leaves by a short girdle passing between segments 4 and 5.

Average time of suspension—2 days.

Time from laying of egg to pupa—26 days.

Pupa.—Length, 9 mm.; width, 4 mm. Of the usual Lycaenid shape. Suspended by a short girdle. The color varies from black with no markings to brown with dark dorsal line and light brown patches on the dorsum. In the light forms the wing-covers are greenish brown with the veins showing in green. The whole surface is heavily

reticulated, giving it a rough appearance under the lens. The spiracles are dull red. Minute setae present on the hind abdominal segments in the vicinity of the spiracles.

EXPLANATION OF PLATE XII.

- Fig. I. Egg.
Fig. II. Showing pattern of network surrounding the egg.
Fig. III. Young larva just emerged.
Fig. IV. Mature larva.
Fig. V. Last three segments showing position of gland and eversible organs.
Fig. VI. Eversible organ distended.
Fig. VII. Dorsal view of pupa.
Fig. VIII. Lateral view of pupa.
Fig. IX. Ventral view of pupa.

Critical Notes on Some Species of Mymaridae (Hymen.).

By A. A. GIRAULT, Brisbane, Queensland, Australia.

FAMILY MYMARIDAE.

SUBFAMILY GONATOCERINAE.

TRIBE GONATOCERINI.

Genus *Litus* Haliday.

1. *Litus cynipseus* Haliday.

It will be of interest to compare this European species with another species, described from Ceylon, namely, *Litus enocki* Howard. I have the type of the latter and of the former, a female specimen sent to the U. S. by Mr. Frederick Enock, of London, and determined by an English authority (see beyond). The slide containing it was labelled "Fredc. Enock, Preparer. Order Hymenoptera. Family Mymaridæ. Genus *Litus*. Species *cynipseus* ♀. The Fairy Fly. Spot lens, 2-inch to 1-inch."

The two species differ as follows: The European species is thrice the size of the species from Ceylon but nearly of the same color, a very intense, dark brown; however, all of the antennæ and the femora are concolorous, not lighter as in *enocki*. The antennæ differ in that the proximal funicle joint in *cynipseus* is distinctly much shorter than funicle joint 2, not much longer than wide; the two joints are slender and sub-equal in *enocki*;

also in the European species the fourth funicle joint is shorter and thicker than in *enocki* and the antennal club much stouter, comparatively enormous. The fore wings differ very much in shape, having a pronounced curve in *enocki* but nearly straight in *cynipseus* and more slender. The caudal wings are more similar but they are dusky and spotted with white in *cynipseus* and appear to lack the line of discal cilia along one margin, bearing only the midlongitudinal line of discal cilia. Also in *cynipseus* the tarsal joints are longer. Another difference is that the scape of the European species along each margin is serrated, each serration giving origin to a seta; this is especially true of the outer margin but probably the whole surface of the scape is roughened, seen thus only in outline at the margins. In *cynipseus*, the strigil is strong. The two species agree, or nearly, in other points but enough has been said to show that they are very distinct from each other.

SUBFAMILY MYMARINAE.

TRIBE ANAPHINI.

Genus *Anaphes* Haliday.

1. *Anaphes punctum* (Shaw) Haliday.

I have as a loan a single female specimen of a mymarid which has been identified by an English entomologist (E. A. Fitch—See Enock, Trans. Ent. Soc., of London, 1909, p. 450), as the above species and transmitted to Dr. L. O. Howard, by Mr. Fred. Enock, of London. It will be of value to point out how this species differs from the American species so far known and described. It is most closely related to *hercules* Girault but is brown instead of black and differs structurally from that species in having both wings somewhat broader and the proximal tarsal joints of the intermediate legs distinctly longer. Otherwise, they are very much alike. However, both appear to be good species. The British species does not resemble closely any of the other American forms of the genus with the possible exception of *pratensis* Foerster which, as I have published elsewhere, is a member of our fauna, providing my identification be correct. The species *punctum* differs from *pratensis* in being different in color, brown instead of black and structurally in possessing differently shaped antennæ; thus, in

pratensis the antennal club is short and stout, only twice longer than broad, thrice longer than broad in the other species and in *pratensis* also, the second funicle joint is distinctly a third longer and much narrower than funicle joint 6, only a fourth longer and but slightly narrower in *punctum*. (The specimen of *pratensis* was captured in Illinois and compared with specimens in the United States National Museum labelled, "Anaphes pratensis Först., France." I have written of them elsewhere).

TRIBE MYMARINI.

Genus *Polynema* Haliday.

1. *Polynema euchariforme* Haliday.

A female of this species, loaned to me by Dr. L. O. Howard and also identified by the English gentleman mentioned above and received in the U. S. through the kindness of Mr. Fred. Enock, should also receive some attention in this connection. As represented here, the species is different from any American form so far known to me, but is much like both *consobrinus* Girault and *striaticorne* Girault in the shape and ciliation of the fore wing. However, it differs from the former in that the fore wings are noticeably less clavate and consequently somewhat narrower; the antennæ differ but not very much, in *euchariforme* the funicle joints all slightly shorter; other differences are the shorter posterior femora and abdominal petiole and the uniformly pallid yellowish legs in the British species. The difference from *striaticorne* is more pronounced—the much less robust body, shorter leg and antennal segments—specifically, in *euchariforme* the third funicle joint is only about half the length of the second, in *striaticorne* three-fourths the length of the second and nearly twice longer of itself than that of the British species—narrower wings and differently colored legs. The fore wings in *euchariforme* bear about ten longitudinal lines of discal cilia at their widest blade portion and their longest marginal cilia are nearly as long as the greatest width of those wings. The club and funicle of antennæ and the distal tarsal joints are concolorous with the brownish black of the body.

At this same time it is desirable to compare this British species with several other European forms which I happen to

have with me. These two are *Polynema flavipes* Walker and *P. fumipenne* Walker: the specimens of the former are from the collections of the United States National Museum and of the latter (two specimens) from Mr. C. O. Waterhouse, sometime of the British Museum. The specimens of *fumipenne* (identified by Mr. Waterhouse, perhaps in association with Mr. Enock) I have described elsewhere; it differs very pronouncedly from *euchariforme*; the fore wings are very much broader, their discal ciliation very much coarser, the body and appendages much longer and slenderer, the legs more intensely colored (orange) and thus the two species should never be confused. The species *flavipes* differs nearly as much, but the discal ciliation of the fore wings in this species is moderately fine, not coarse; the coloration is somewhat as in *fumipenne*. L

Thus, here are three distinct British species of the genus which differ from any American form known to me and I describe a fourth below.

The following specimens: *Polynema euchariforme* Haliday—a single female on a slide loaned by Dr. L. O. Howard and labelled "Fredc. Enock, preparer. Order Hymenoptera. Family Mymaridæ. Genus *Cosmocoma*. Species *euchariformis* ♀. The Large Fairy Fly. Spot lens, 2-inch to 1/2-inch."

Polynema flavipes Walker—A pair found mounted on tags in the United States National Museum collection, now remounted in xylol-balsam and labelled "*Polynema flavipes*, Walker, ♀ ♂ Am. Ent. Soc. To be returned."

Polynema fumipenne Walker—Two females kindly sent to me by Mr. C. O. Waterhouse, now mounted in xylol-balsam and labelled, "*Cosmocoma fumipennis* Walker. Eng. Richmond, 24.9.09. C. Waterhouse, Whitehouse Plantations."

2. *Polynema brittanum* new species.

Normal position.

Male.—Length, 0.80 mm. Moderate to moderately small for the genus. About the same size as *euchariforme* with which it was confused.

General color brownish black or black suffused with some brown, including venation, antennæ, intermediate and posterior femora and tibiæ and distal tarsal joints. Pedicel of antenna suffused with yellowish. Trochanters, knees, tips of tibiæ, proximal three tarsal joints and cephalic legs yellowish, the tarsal joints paler. Wings hyaline.

Falls in with the group of allied species containing *consobrinus* Girault, *aspidioti* Girault, *howardii* Ashmead, *striaticorne* Girault and *euchariforme* Haliday, and most closely allied with *consobrinus* and *striaticorne*; it resembles both casually. However, it differs from *consobrinus* in having the discal ciliation of the fore wing finer and more uniform, the wing somewhat wider (about 16 longitudinal lines of discal cilia across the widest part), its marginal cilia distinctly shorter (the longest about two-thirds the greatest wing width), especially noticeable along the cephalic margin of the blade; the marginal cilia of the posterior wings are likewise shorter, about a half shorter; the proximal tarsal joints are much longer and slender, those of the cephalic tarsi for example, being at least a third longer. The two species otherwise alike as far as could be seen.

From *striaticorne* Girault, the species differs about as much as it does from *consobrinus*, in having the marginal cilia of the fore and posterior wings shorter but the fore wing is somewhat narrower than in *striaticorne*; the legs are formed very much as in the latter but the intermediate and caudal femora are distinctly shorter; the joints of the flagellum are uniformly shorter than those of *striaticorne*, about a fourth or more shorter. Thus, *brittanum* is more nearly like the last named species, especially in tarsal segments, color and discal ciliation of the fore wings.

From the species *howardii* Ashmead it may be distinguished much as *striaticorne* may be, namely by lacking the peculiar arrangement of the marginal cilia of the fore wing; also *brittanum* has finer discal ciliation in the fore wing which is also narrower and bears (as does also the caudal wing) much shorter marginal cilia. The caudal wing in *brittanum* is fuscated distad as it is slightly with *howardii*.

From the species *aspidioti* Girault, *brittanum* differs again in lacking the peculiar arrangement of the marginal cilia of the fore wings and in bearing distinctly shorter marginal cilia on that wing; again, in having the wing differently shaped; around the apex of the fore wing in *aspidioti* the marginal cilia shorten just at the apex; in *brittanum* no shortening occurs but a gradual lengthening from the cephalic wing margin; *brittanum* differs from *aspidioti* in the color of the legs, all tarsi

being pallid yellowish to the distal joint as in the cephalic and intermediate legs of *aspidioti*, but all of the caudal tarsus in the latter species is brown black. The antennal joints are slightly longer in *brittanum*.

From *euchariforme* Haliday, with which this species was confused as shown below, *brittanum* differs in bearing distinctly broader fore wings which bear distinctly shorter marginal cilia along the cephalic wing margin and in having darker legs. Its wings (speaking of *brittanum*) are moderately broad.

(From one specimen, two-thirds-inch objective, one-inch optic, Bausch and Lomb).

Female.—Unknown.

Described from a single male specimen loaned to me for study by Dr. L. O. Howard, and being another one of the series of English species sent to the U. S. by Mr. Fred. Enock, of London. The slide bearing it was labelled, "Fredc. Enock, preparer. Order Hymenoptera. Family Mymaridæ. Genus *Cosmocoma*. Species *euchariformis* ♂. The Large Fairy Fly. Spot lens, 2-inch to ½-inch." Thus, the species was taken for the male of *euchariforme* Haliday.

Habitat.—England (?London or vicinity).

Type.—Catalogue No. 14,207. United States National Museum, Washington, D. C., one male in balsam.

I have pointed out in this brief paper the characteristics of some of the European forms of the family Mymaridæ, evidently some of the more common and abundant of the species occurring in England. They have all proved to be distinct from our more common American species. *Anaphes pratensis* Foerster, however, occurs in this country as noted above and elsewhere; I have no knowledge concerning whether or not it may have been introduced or whether it may not have originated here. As concerns the identification of these species I am not altogether satisfied, since the European Mymaridæ are now in a state of much confusion due to their long neglect and also because in most cases the authority for identifications is not definitely stated.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, four weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.—Ed.

PHILADELPHIA, PA., OCTOBER, 1911.

During the past twelve months three papers—and doubtless others—have appeared urging a reformation in the preparation and manner of publication of scientific papers.

One of these, "How to Prepare a Paper for Publication," read at the Marine Biological Laboratory, Wood's Hole, Mass., July 5, 1910, by C. Bowyer Vaux, of the Wistar Institute of Anatomy and Biology, Philadelphia, will be forwarded by the Waverly Press, Williams & Wilkins Co., Proprietors, Baltimore, Maryland, to anyone interested. This pamphlet of twenty pages describes the various technical processes involved in editing, making and printing both text and illustrations, and publishing, and offers many suggestions to authors, as well as to the others concerned.

The other two papers appeared in June, 1911, in Number 2, Volume IV, of the *Annals of The Entomological Society of America*. Prof. T. D. A. Cockerell offers "Some Suggested Rules to Govern Entomological Publications," particularly in regard to descriptions of new species. Mr. R. A. Muttkowski's "The Composition of Taxonomic Papers" is longer (it occupies 24 pages) and is directed especially at authors, although editors also are involved. It proposes standards for descriptions, colors, nomenclature, keys to genera and species, indices, titles and reprints.

That reformation and standardization are highly desirable most will probably admit, even though we may not agree on all the details. The first step in the reform is to acquaint all concerned with the proposals which have been made and the NEWS can not urge too strongly the reading of these three articles. If each author will then take care to improve his own manuscripts as suggested, great progress will be made. The refusal by editors of manuscripts which do not conform to well-considered requirements may be a future movement in the same direction.

Notes and News

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

AN ENTOMOLOGICAL POST CARD.—No. 403 of Raphael Tuck & Sons' Educational Series of Post Cards, entitled "Butterflies," contains five colored embossed pictures of East Indian butterflies with their technical names, habitats and a brief nine-line statement in small type of the life history of Lepidoptera in general and the features distinguishing butterflies from moths.

LEPIDOPTERA OF ST. LOUIS, MO., 1910.—I think *Strenoloma lunilinea* ought to be added to the list of Heterocera unusually common in the vicinity of St. Louis, Mo., during 1910 (See the NEWS for July, 1911, page 323). During the latter part of summer this species was a veritable pest to the collector at sugar.—EDWIN P. MEINERS, St. Louis, Mo.

EREBUS ODORA in the United States.—We have just captured here at Madison, Wisconsin, July 7th, 1911, following several days of extreme heat and south winds, an almost perfect specimen of the West Indian *Erebus odora*.—J. G. SANDERS.

On August 6, 1911, at Sachem Head, Connecticut, on Long Island Sound, Mr. Richard Shryock brought to me a vigorous *E. odora* taken in a house there.—P. P. CALVERT.

CABBAGE WHITE BUTTERFLIES.—Would some entomologist state if he knows of any reference to the fact that the larvae of the Large Cabbage White seek to arrange themselves in pairs—male and female—when they pupate?

Can the sexes be distinguished externally in the larval and in the pupal stages?—E. W. READ, Sutherland Technical School, Golspie, England. (From *Nature*, for July 20, 1911.)

CATOCALA DULCIALA, described by Grote, was collected by Dr. M. G. Conklin, of Dayton, Ohio, and not by me.—G. R. PILATE, Loma Linda, California.

IMPROVED METHODS OF PHOTOGRAPHING the tunnels of bark-beetles are suggested in a German translation from the Russian of P. Winoogradoff, in *Entomologische Blätter*, VII, pp. 146-147, 1911.

MR. ROBERT NEWSTEAD, lecturer in economic entomology and parasitology in the Liverpool School of Tropical Medicine has been appointed to the newly-established Dutton Memorial Chair of Entomology in the University of Liverpool.—*Science*.

BOOK-DESTROYING INSECTS.—An exhibition of books collected from different parts of the world by William R. Reinick, of the Free Library of Philadelphia, showing the various ways in which they are destroyed by insect life, was held in the library of the University of Pennsylvania, Thirty-fourth and Locust streets, for two weeks commencing July 28, 1911. Mr. Reinick also delivered an illustrated lecture upon "Insects Destructive to Books" in the lecture hall of Houston Hall, of the same university, on July 28.

HONORARY DEGREES conferred on Entomologists.—On June 14, 1911, the University of Pittsburgh, Pennsylvania, conferred the degree of doctor of science on Dr. Henry Skinner, Editor Emeritus of the NEWS. A few days later, The George Washington University, of Washington, gave to Dr. L. O. Howard, Chief of the U. S. Bureau of Entomology, the honorary degree of doctor of medicine, for "distinguished services to science in relation to preventive medicine."

MYRIADS OF MOTHS.—Kensington, (Philadelphia) was invaded last night (July 9, 1911) by myriads of a small species of moth or "miller," which swarmed in the streets and stores so thickly that business and even traffic was for a time suspended.

They flew so thickly in the streets that hundreds of pedestrians took refuge in the stores along Kensington and Frankford avenues and the streets running between them. They then began to fly into the stores, and at the lights, so that merchants had to close their doors and discontinue business while they secured brooms and swept out the dead ones.

In many places the sidewalks were covered to the depth of an inch for a block or more, and by getting into the eyes, nostrils, ears and mouths of pedestrians the little "millers" almost completely stopped traffic.

A Second and Ritner streets trolley car was completely held up. Without any notice a vast company of the "millers" swarmed through the open window on the front platform, blinding and choking the motorman, and doing the same for the passengers and conductor.

The motorman, John Sirch, stopped his car until he and his conductor, George Sands, and the passengers could rid themselves of the invaders.

Friday night is the busiest time of the week for the Kensington merchants, and it is said that the enforced discontinuance of business for an hour or more last night means the loss of several thousands of dollars to the business men.

The great army of moths eventually destroyed itself by flying against the street lights and store windows and practically carpeted the entire section.—*Philadelphia Public Ledger*, July 10, 1911.

[Some of the moths were observed also at the Academy of Natural Sciences and were identified by Dr. Henry Skinner as *Tortrix fumiferana* Clemens.]

A HEMIPTEROUS FISHERMAN.—The habits of the Belostomidae are known in a general way, but specific examples seem to be scarce in literature. Mr. J. R. Bueno (*Journal of New York Entomological Society*, XVIII, 143) cites Uhler (*Standard*, now *Riverside*, *Natural History*, II, 256), Howard (*Insect Book*, 278), and others (*Proceedings Washington Entomological Society*, III, 87) to the effect that the larger species of the family feed upon small aquatic animals, even fish, and that they may become quite harmful if abundant where young fish are reared by artificial methods.

On September 3d, 1910, the following letter, with accompanying specimens, was received at the Experiment Station and referred to me.

Lyme, Conn., Sept. 2, 1910.

Agricultural Expt. Station.

Gentlemen:

I am sending you under separate cover a bug for identification.

While watering my cattle at a small stream, my attention was drawn to a small fish flopping in the water near the shore. Thinking it was caught in the grass, I poked it into the stream, when I saw that it was caught by a bug.

The bug had its three pairs of legs around the fish so tightly that the fish was creased by the legs. The bug had its "beak" stuck into the seam under the fish's under jaw (gills), and seemed to be sucking the life out of it.

I took bug and fish to my home and showed them to my family, and it was not until a pin was about to be thrust through them that the bug released the fish, which by that time was dead.

I am greatly interested, as I never before heard of a bug preying upon small fish.

Respectfully,

CHAS. H. DAVISON.

The bug in question was *Lethocerus* (*Belostoma*) *americanus* Leidy, and measured about two and one-fourth inches in length. The fish was a young banded pickerel, *Lucius americanus* Gmelin, nearly three and five-eighths inches long. It was kindly identified for me by Professor Bashford Dean. I send Mr. Davison's letter, thinking that the observation may be of some interest to readers of the NEWS, as it records a specific instance of a fish being captured by one of these bugs.—W. E. BRITTON, New Haven, Conn.

THE COLLECTION AND LIBRARY of the well-known Dipterologist Victor V. Roeder, who died in Hoya, Anhalt, Germany, Dec. 26 1910, have been presented to the Zoological Museum of the University of Halle.

THE CAMPAIGN AGAINST HOUSE FLIES.—San Antonio, Tex., July 4.—One and a quarter million dead flies in one heap, contributing a pile three feet high and five feet wide, represents the slaughter wrought by small boys as the result of a fly-killing contest which closed here today. Robert Basse carried off first prize of \$10 with an official record of 484,320 dead flies.—*Newspaper*.

Worcester, Mass., July 13.—More than 10 barrels of flies were gathered by 232 contestants in an anti-fly crusade, which began on June 22 and ended tonight. The winner, who gets a prize of \$100, turned in 95 quarts, or a total of 1,219,000 flies captured in traps of his own construction, and claims the world's championship. He is Earl C. Bousquet, 12 years old.—*Newspaper*.

CHANGES OF POSITION AND OF ADDRESS.—Dr. Alex. D. MacGillivray has become Assistant Professor of Systematic Entomology at the University of Illinois, and his address is now 604 East John Street, Campaign, Illinois. Members of the Entomological Society of America, of which Dr. MacGillivray is Secretary-Treasurer, are requested to take notice of his removal.

Dr. J. Chester Bradley has accepted the position of Assistant Professor of Systematic Entomology in Cornell University, as the successor of Dr. MacGillivray; his address is The Entomological Laboratory, Cornell University, Ithaca, New York.

Mr. A. A. Girault, recently at Urbana, Illinois, has been appointed Entomologist to the Department of Agriculture of Queensland, and should be addressed at Brisbane, Queensland, Australia.

THE SCHILSKY COLLECTION OF COLEOPTERA.—The collection of palaearctic Coleoptera formed by Herr J. Schilsky, the present President of the Deutsche Entomologische Gesellschaft, has come into the possession of the Royal Zoological Museum in Berlin. It consists of 107,814 specimens of 8181 palaearctic species. It includes types of about 500 species described by its possessor, especially in the families Dasytidae,

Anobiidae, Bostrichidae, Cioidae, Sphindidae, Mordellidae, Bruchidae, Rhynchitidae, Apoderidae and many Curculionidae, particularly the genera *Apion*, *Phyllobius*, *Polydrosus*, etc. There are also many specimens which have been compared with the types of Desbrochers, Eppelsheim, Ganglbauer, V. Heyden, Kraatz, Reitter, Weise and other authors. Further details will be found in *Deutsche Entomologische Zeitschrift*, 1911, pp. 107-109. The same museum has also acquired the "greatest special collection of Italian beetles," that of Prof. Fiori (l. c. p. 353).

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), excluding Arachnida and Myriapoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in Heavy-Faced Type refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted. This (*) following a record, denotes that the paper in question contains description of a new North American form.

For record of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

4—The Canadian Entomologist. 5—Psyche, Cambridge, Mass. 7—U. S. Department of Agriculture, Bureau of Entomology. 9—The Entomologist, London. 12—Comptes Rendus, L'Academie des Sciences, Paris. 22—Zoologischer Anzeiger, Leipzig. 46—Tijdschrift voor Entomologie. 50—Proceedings, U. S. National Museum. 51—Novitates Zoologicae, Tring, England. 59—Sitzungsberichte, Gesellschaft der naturforschenden Freunde, Berlin. 73—Archives, Zoologie Experimentale et Generale, Paris. 75—Annual Report, Entomological Society of Ontario, Toronto. 84—Entomologische Rundschau. 92—Zeitschrift für wissenschaftliche Insektenbiologie. 102—Proceedings, Entomological Society of Washington. 123—Bulletin, Wisconsin Natural History Society, Milwaukee. 131—Proceedings, South London Entomological and Natural History Society. 143—Ohio Naturalist. 166—Internationale Entomologische Zeitschrift, Guben. 179—Journal of Economic Entomology. 186—Journal of Economic Biology, London. 193—Entomologische Blätter, Nürnberg. 241—Marcellia. Rivista Internazionale di Cecidologia. Avellino. 245—Zeitschrift, Naturwissenschaften, Halle. 251—Annales, Sciences Naturelles, Zoologie, Paris. 278—Annales, Societe Zoologique Suisse et du Museum

d'Histoire de Geneve, Revue Suisse de Zoologie. **322**—Journal of Morphology, Philadelphia. **336**—Board of Agriculture, Trinidad. **338**—University of Minnesota Agricultural Experiment Station, St. Paul. **339**—Kosmos. We Lwowie (Limberg).

GENERAL SUBJECT. Barber, H. S.—A simple trap-light device, **102**, 1911, 72-73. Chapman, T. A.—On insect teratology (remarks to introduce a discussion on Teratological specimens), **131**, 1910-11, 39-53. Gibson, A.—Basswood or linden insects IV, **75**, 1910, 99-101. Girault, A. A.—Incidental observations on a queen of *Polistes pallipes* while founding a colony, including fragmentary biological notes, **123**, 1911, 49-63. Heuer, A.—Ein erprobter puppenkasten, **166**, v, 77. Hewitt, C. G.—The teaching of insect life and its practical importance, **18**, 1911, 63-67. Some observations on the practical importance of the study of parasitic insects, **75**, 1910, 62-64. The more injurious insects in Canada during the year 1910, **75**, 1910, 27-29. Howard, L. D.—Brief notes of two recent trips, **102**, 1911, 77-79. Kaye, W. J.—An entomological trip to South Brazil, **131**, 1910-11, 54-66. Lefroy, H. M.—The training of an economic entomologist, **186**, 1911, 50-58. Needham, J. G.—The role of insects in water-life, **75**, 1910, 42-43. Pemberton, C. E.—The sound-making of Diptera and Hymenoptera, **5**, 1911, 114-118. Sitowski, L.—Merkwürdige mimikry-beispiele der heimischen insekten fauna (Native), **339**, 1911, 251-262. Swaine, J. M.—Some insects of the larch, **75**, 1910, 81-88. Trotter, A.—Contributo alla conoscenza delle galle dell' America del Nord, **241**, x, 28-61 (*). Washburn, F. L.—Cut worms, army worms and grasshoppers, **338**, Bull. No. 123. Webster, F. M.—The diffusion of insects in North America, **102**, 1911, 2-4.

APTERA & NEUROPTERA. Banks, N.—*Paranthaclisis hageni* in Texas, **102**, 1911, 71. Holmgren, N.—Bemerkungen uber einige termiten-arten, **22**, xxxvii, 545-553. Jacobson, E.—Mallophaga transported by Hippoboscidae, **46**, 1911, 168-169. Jordan & Rothschild—Katalog der Siphonapteren des Koniglichen Zoologischen Museums in Berlin, **51**, xviii, 57-89. Lucas, W. J.—The natural order of insects—Neuroptera, **131**, 1910-11, 66-73. Moulton, D.—Synopsis, catalogue and bibliography of North American Thysanoptera, with descriptions of n. sp., **7**, Tech. Ser. No. 21, 56 pp. (*). Muttkowski, R. A.—New records of Wisconsin dragon flies, II, **123**, 1911, 28-41 (*). Rothschild, N. C.—On the bat-fleas described by Kolenati, **51**, xviii, 48-56. Some n. g. and sp. of Siphonaptera, **51**, xviii, 117-122. Urich, F. W.—The cacao thrips, **336**, 14 pp.

ORTHOPTERA. Allard, H. A.—The stridulations of two interesting Locustidae, **5**, 1911, 118-119. Xiphidion stridulations, **102**, 1911, 84-87. Caudell, A. N.—A new cactus-frequenting Orthopteron

from Texas, **102**, 1911, 79-86 (*). **Criddle, N.**—The migration of some native locusts, **75**, 1910, 60-61. **Severin & Severin.**—A few suggestions on the care of the eggs and the rearing of the walking-stick, *Diapheromera femorata*, **5**, 1911, 121-123. The life history of the walking-stick, *Diapheromera femorata*, **179**, 1911, 307-320.

HEMIPTERA. **Davis, J. J.**—List of the Aphididae of Illinois with notes on some of the species, **179**, 1911, 325-331. **Gillette, C. P.**—Two *Rhopalosiphum* species and *Aphis pulverulens*, n. sp., **179**, 1911, 320-325 (*). **Jacobson, E.**—Biological notes on the Hemipteron *Ptilocerus ochraceus*, **46**, 1911, 175-179. **Jarvis, T. D.**—The coccidae of Canada, **75**, 1910, 64-76. Aleyrodidae of Ontario, **75**, 1910, 78-81. **Kirkaldy, G. W.**—Some remarks on the reduviid subfamily Holoptilinae and on the species *Ptilocerus ochraceus*, **46**, 1911, 170-174. **Lindinger, L.**—Beitrage zur kenntnis der schild-lause und ihre verbreitung II, **92**, 1911, 86-90, 126-130 (cont.). **McDermott, F. A.**—The attack of a larval Hemiptera upon a caterpillar, **102**, 1911, 90-91. **Pemberton, C.**—The California Christmas-berry tingis, **179**, 1911, 339-343. **Quayle, H. J.**—Locomotion of certain young scale insects, **179**, 1911, 301-306. **Sasscer, E. R.**—Catalogue of recently described Coccidae III, **7**, Tech. Ser., No. 16, pt. iv. **de la Torre Bueno, J. R.**—On *Halobaslopsis beginii*, **4**, 1911, 226-228. **Urlich, F. W.**—Identification of the sugar cane froghopper, **336**, Soc. Pap. No. 448,, 3 pp. Interim report of froghoppers, **336**, 8 pp., 1910.

LEPIDOPTERA. **Bordas, L.**—L'appareil digestif et les tubes de Malpighi des larves des lepidopteres, **251**, xiv, 191-192. **Britton, W. E.**—The leopard moth as a pest of apple nursery stock, **179**, 1911, 298-299. **Cory, E. N.**—Notes on the egg-laying habits and emergence of adult of *Sanninoidea exitiosa*, **179**, 1911, 332-336. **Dyar, H. G.**—Notes on the grass-feeding *Hemileucas* and their allies. A note on *Halisidota cinctipes*, **102**, 1911, 5-10 (*). A new Arctian new to our fauna, **102**, 1911, 15. Notes on the American species of *Olene*. Two Noctuids new to our fauna, **102**, 1911, 16-20 (*). A synonymic note—(*Isogona reniformis* Smith = *I. agilaria* Druce). Two sp. of *Phycitinae* new to our fauna, **102**, 1911, 30 (*). A new *Basilodes* from Texas, **102**, 1911, 64 (*). Two new North American species of *Eustrotia*. A n. g. for *Cirrhophanus duplicatus*. Note on an Arizona Notodontian, **102**, 1911, 68-69 (*). A new sp. of *Dioryctria*, **102**, 1911, 81 (*). A new *Coloradia*, **102**, 1911, 89 (*). Change of genus for certain species of *Cochliidiidae* **102**, 1911, 106. **Forbes, W. T. M.**—Another aquatic caterpillar (*Elophila*), **5**, 1911, 120-121. **Glaser, R.**—Ueber temperaturexperimente bei Schmetterlengspuppen, **84**, xxviii, 89-92. **Grossbeck, J.**

A.—A new Canadian Geometrid, 4, 1911, 225-226 (*). Heath, E. F.—Notes of captures of Lepidoptera at sugar and light during 1910 at my farm on Long River, near Cartwright, Southern Manitoba, and also of the results of the overhauling of several cases of duplicates, 4, 1911, 245-250. Jordan, K.—Descriptions of new Saturniidae. Some new Sphingidae, 51, xviii, 129-136. Kaye, W. J.—Neuration of Lepidoptera, 131, 1911, 81-93. Pearsall, R. F.—Geometridae as yet undescribed, 4, 1911, 250-253 (cont.) (*). Rothschild, W.—New Aegeriidae. New syntomidae in the Tring Museum, 51, xviii, 24-47 (*). Sassocer, E. R.—Note on the cork-covered orange tortricid. (Platynota rostrana), 179, 1911, 297-298. Schaus, W.—New sp. of Heterocera from Costa Rica, 11, vii, 612-634. Descriptions of six new American Heterocera, 102, 1911, 42-44. Stobbe, R.—Ueber das abdominale sinnesorgan und uber den gehörsinn der Lepidopteren mit besonderer berucksichtigung der Noctuiden, 59, 1911, 93-105. Strand, E.—Eine neue Pericopiide aus Brasilien, 166, v, 77. Sweet, L. W.—Geometrid notes. A new Eupithecia, 4, 1911 255-256 (*). Wolley Dod, F. H.—Further notes on Alberta Lepidoptera, 4, 1911, 229-236, 281-286.

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L.—Hymenoptera in Smith's insects of New Jersey, 3rd edition, 1910, 102, 1911, 93-99. Two genera of Ichneumonoidea, 102, 1911, 123. Wheeler, W. M.—Two fungus-growing ants from Arizona, 5, 1911, 95-101 (*). The ant-colony as an organism, 322, xxii, 307-325.

LEPIDOPTERORUM CATALOGUS.—W. Junk of Berlin announces that he has undertaken the publication of a catalogue of the Lepidoptera of the world, similar to the Coleopterorum Catalogus, of which 32 parts have been issued in 1910 and 1911. The catalogue of Lepidoptera will be edited by Prof. Ch. Aurivillius, of the Swedish Academy of Sciences, and H. Wagner, formerly assistant to Prof. Standfuss and now at the Entomological National Museum of Berlin. Each of the 61 families of Lepidoptera will be entrusted to a leading specialist.

HUBNER'S EXOTIC BUTTERFLIES.—A prospectus signed by W. F. Kirby, dated Chiswick, London, April, 1911, announces a new English fac-simile edition of Hübner's "Sammlung exotischer Schmetterlinge" (1806-1838?) in three volumes with 490 hand colored plates, together with the "Zuträge" to the same by Hübner and Geyer (1818-1837) in one volume with 170 hand colored plates. The original edition of the "Sammlung" contained hardly any text, while that of the "Zuträge" was complete. This new English edition is limited to 50 copies. The publishers are V. Verteneuil and L. Desmet, 60-62, rue T'Kint, Brussels. Mr. Kirby says "In writing letter press to Hübner's 'Sammlung exotischer Schmetterlinge,' I have paid special attention to the correct identification of the species figured, and in one or two cases I have found it necessary to propose new names. I have not given descriptions, but sufficient synonymy and explanations to bring Hübner's plates into range with later publications."

Doings of Societies.

ENTOMOLOGICAL SECTION, ACADEMY OF NATURAL SCIENCES, PHILA.

Meeting of May 25th, 1911. Mr. Philip Laurent, Director presiding. Eleven persons present.

Dr. Skinner exhibited specimens of *Libythea bachmanni* without palpi (snoutlers) received from Mr. J. R. Haskin of Los Angeles, California, and collected in Arizona. Also a new variety of *Megathymus yucca* received from Mr. W. C. Wood of New York. It is very small and black in color.

Dr. Calvert remarked that the highest altitudes in Costa Rica from which Odonata were recorded in the *Biologia Centrali-Americana* were 6000-7000 feet, the specimens from Irazu by H. Rogers (1877) in Dr. F. D. Godman's collection being so labeled. During the year which the speaker spent in Costa Rica, he had sought repeatedly for these insects at higher altitudes, especially on three visits (July and September, 1909, March, 1910) to the summit of Irazu (11,300 feet), but had not seen any Odonata at a greater height than about 6450 feet, near the village of Tierra Blanca. On July 13, 1909, he had visited the Laguna del Reventado, or Laguna del Dirumbo, at an altitude of 9100 feet on the southwest slope of Irazu, and although the locality and weather seemed favorable, not a single dragonfly was seen there. In July, 1910, Prof. J. Fidel Tristán was at this laguna and soon after wrote that he had seen "three big dragonflies flying on the laguna. They were of a dark color and I tried to catch them, but my efforts were not enough."

A still later letter from Prof. Tristán, dated May 11, 1911, was read by the speaker as follows: "On the 12th of April I went up to Tierra Blanca where I spent several days.

* * * From Tierra Blanca I went up to Reventado twice and spent all the day collecting. The first day I went directly to the pond and remained there several hours. I looked with interest for the dragonflies and also I examined the roots and aquatic plants but I was unable to discover any insect or any larvae. From the pond I went along the river Reventado but the rain and the mist obliged me to go back. The second day I went again; the day was very clear but no insects were flying. I returned early and I left the narrow road and entered in the forest on the west side very near the old crater where in a small rivulet I discovered only one *pipilacha*.* As the place is very high I thought it was interesting to you and, of course, I tried to collect more but in the rest of the day (five hours) no other one was seen. Here is

*Native Costa Rican name for Odonata.—P. P. C.

a sketch of the place." The specimen sent by Prof. Tristán was exhibited; it is labeled, "In a rivulet near Laguna del Reventado, April, 1911, J. F. Tristán," in his handwriting. It is a male *Argia terira* Calvert and furnishes therefore the record for the highest altitude for Odonata in Central America, while the highest altitude for them in Mexico is about the same.* In New Mexico, Prof. Cockerell and Dr. Skinner have collected Odonata at 11,000 and 10,000 feet respectively.† The mean annual temperature of Laguna del Reventado is probably about 52 degrees F. (11 degrees C.), or 2 degrees F. lower than that of Philadelphia, and there is much precipitation throughout the year.

The same speaker also exhibited a female *Mecistogaster modestus* Selys which had transformed from a larva collected in bromeliads near Orosi, Costa Rica, by Señor C. Picado T. The imago and exuvia were also sent by Prof. Tristán. (Cf. Ent. News, xxi, pp. 264, 365).

Mr. Rehn exhibited specimens of *Doru aculeata* and *Manomera blatchleyi* from Indiana and Illinois. Both species are rare in collections and the latter is new to the Academy collection. The specimens were presented by Mr. Wm. J. Gerhard.

Mr. Laurent remarked that many collectors of Coleoptera started out to do "umbrella work" trusting to luck to cut a stick or club on reaching the collecting grounds—such a stick or club being but a "make shift" at the best. The speaker stated that nothing was better than a discarded broom-handle or rake-handle, which can be carried to the collecting ground in a fishing-rod bag; as carried without the bag, the collector may be taken for a tramp which often times is the case.

It was decided to hold the December meeting on the second Monday of that month.

HENRY SKINNER, *Recorder.*

*See Calvert, The Composition and Ecological Relations of the Odonate Fauna of Mexico and Central America. Proc. Acad. Nat. Sci., Phila., 1908, page 460.

†Biol. Cent. Amer., Neur., pp. 109, 110.

THE ST. LOUIS ENTOMOLOGICAL CLUB.

Since its inception, in April, 1904, the St. Louis Entomological Club has been active in promoting an interest in entomology, both systematic and ecologic, among its members.

The rules and regulations of the club provide that the membership be limited to twelve, so that each may have an opportunity of entertaining the rest at least once every twelve months.

An aspirant to membership must, by invitation, attend at least three consecutive meetings, after which a ballot vote is taken. To elect, the vote must be unanimous. The meetings are held on the second Saturday evening of each month, at the homes of the members or at any place that may be convenient to the host. The meetings are informal, being in the form of a friendly gathering of men interested in the study of insects.

The member who is to entertain the club notifies every other member by mail at least three days previous to the meeting. In case a member cannot attend he at once sends notice to that effect. The host is required to prepare and read a paper pertaining to some phase of entomology which is then discussed. These discussions usually prove a valuable aid to the members. The host is also required to prepare a simple luncheon for the members, of which only those who care to do so participate. I may add, confidentially, that as yet there has been no declination.

There are no officers except a Secretary, who keeps a record of the meetings and has charge of the papers read. There are no dues but in case of necessary printing each member is requested to pay an equal part.

The following are at this time members of the club, and each one extends a cordial invitation to correspond to anyone who wishes to obtain information regarding the insects of this section: Messrs. M. W. Schmidt, 721 Carpenter Place; Geo. H. Hosenfeldt, 3673 South Broadway; Paul Schroers, 3861a McRee Avenue; Ernst Schwarz, 6310 Newstead Avenue;

Henry J. Nelle, 4807 Milentz Avenue; Hermann Schwarz, 720 Clark Avenue, Webster Groves, Mo.; Louis Schnell, 5312 Murdoch Avenue; Chas. Dieckmann, 651 Atalanta Avenue, Webster Groves, Mo.; Frank Malkmus, 3850 Cottage Avenue.

HERMANN SCHWARZ, *Secretary*.

FELDMAN COLLECTING SOCIAL.

Meeting of April 19th, 1911, at 1523 S. 13th St., Philadelphia. Nine members present, Pres. Haimbach in the chair.

Mr. Daecke said many twigs had been collected at the beginning of the year around Harrisburg and already many Coleoptera and accompanying parasitic Hymenoptera have emerged. He had taken *Euherrichia granitosa* (Lep.) at Brown's Mills V-27 and had sent the record to Prof. Smith, but it was credited in the 1909 New Jersey List, p. 473, to *E. mollissima* Gn.

Mr. Geo. M. Greene exhibited a specimen of *Hemipeplus marginipennis* Le C. (Col.) collected by Mr. John Freeman, Phila., April 9, 1911, running on a newspaper. Dr. Castle has taken this species commonly in Florida on the palm, and said as this specimen was caught on Palm Sunday it was most likely brought here on the leaves for that day.

Meeting of May 17th, 1911, at 1523 S. 13th St., Philadelphia. Thirteen members were present. Vice-president Wenzel in the chair.

Prof. Smith said that *Serica iricolor* Say had been reported from Hammonton, New Jersey, May 10, 1911, and a few other localities as injurious to peach trees. The flight seems to be in late afternoon or early evening and as they fed on the young shoots the trees were almost completely stripped of the foliage they had at that time.

Pomphopoea aenea Say was reported as common on fruit blossoms in southern New Jersey; Mr. Wenzel recorded it from Malaga and Mr. C. T. Greene from Glassboro.

Prof. Smith continued to say that everywhere in literature the Plum Curculio is reported as hibernating under rubbish

and he had sent a man out for the species and in about three weeks' collecting had managed to get one specimen which he believed to be accidental. Later when specimens were caught they were perfectly fresh as though they had just emerged. Also stated that cut worms were very numerous.

Mr. Wenzel said he had found wire worms in great numbers at Malaga, N. J., May 14; two species mentioned were *Corymbites inflatus* Say and a species of *Cardiophorus*.

Mr. Daecke exhibited specimens of a Caddice fly, *Leptocella exquisita* Wlk., from Harrisburg, Pa., July 2, 09, which he said surprised him by its close resemblance to a Microlepidopter, *Adela ridingsella* Clem. *Haltica chalybea* Ill. has been reported as common from several counties of Pennsylvania on flowers of grape and *Odontota dorsalis* Thunb as very common on all plant life.

Mr. Harbeck exhibited and recorded *Psychomorpha epimenis* Dru. (Lep.) from Glassboro, N. J., April 30. Prof. Smith said it was at one time common in Essex Co., the larvae having the habit of rolling up the leaves of the grape.

Mr. Huntington gave a general description of the fauna and flora of Bermuda saying he was surprised at the scarcity of insect life, the only common things being flies. Described a large spider similar to the bird-killing spider of South America. Photos of many parts of the islands were shown.

Mr. C. T. Greene exhibited and recorded the following Diptera: *Polidea areos* Walk. Lehigh Gap, Pa., Sept. 6, 1909; *Leucostoma atra* Town., Lehigh Gap, Pa., Sept. 6, 1909; *Cholomyia inaequipes* Bigot, Castle Rock, Pa., August 29, 1909, and *Sarcophaga (Helicobia) quadrisetosa* Coq., Wenonah, N. J., August 21, 1910, all collected by himself.

Mr. Wenzel exhibited some Coleoptera collected this year by his son and himself among which were notable ten specimens of *Buprestis ultramarina* Say, Malaga, N. J., April 29 to May 14, and a specimen of the Californian Coccinellid *Coccinella transversoguttata* Fabr. which is the first New Jersey record.

Adjourned to the annex.—GEO. M. GREENE, *Secretary*.



ASPIDIOTUS TSUGAE—MARLATT.

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AND

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A Newly-Imported Scale-Pest on Japanese Hemlock (Rhynch.).

By C. L. MARLATT, Bureau of Entomology, U. S. Dept. of Agriculture, Washington, D. C.

(Plate XIII.)

Aspidiotus (*Diaspidiotus*) *tsugae* n. sp.

Scale of female.—Diameter, 1 1-3 mm.; circular, strongly convex, dark brown, rather pointed or nipped at center; central area usually covered by secretion, when rubbed a light resinous yellow.

Scale of male.—The normal oval shape, much smaller than female, secretion covering center or nipple, somewhat ashen, forming a light central spot.

Adult female.—Oval; .85 mm. long, .68 mm. broad, in general hyaline as mounted in balsam; *anal plate* broad, rounded, .34 mm. broad at extreme base, and .18 mm. long, nearly hyaline except the paraphyses; two pairs of short and rounded lobes, latter condition probably due to wear (newly molted adult individuals will probably exhibit the usual lateral shoulders); beyond the second lateral incision a prominent serrated projection having three or more distinct minute teeth; edge of pygidium beyond this projection unbroken; incisions median and lateral scarcely below the general level of the edge of the pygidium; paraphyses very prominent and robust, pear-shaped, two prominent ones at the base of each lobe, most of them fully lobe length, and another below the second lateral incision; also a few smaller para-

physes in the lobular area; plates broad, branched at tip, equaling the lobes in length, two median, two in first lateral incision and three in second lateral incision; spines short, inconspicuous; anal opening large, oval, in longest diameter more than twice lobe length, less than twice its own length from apex; paragenitals, counting from the anterior group, 2-4, 5-7, 4-5, not massed, no parastigmal pores; dorsal pores large, narrow, those easily seen are row of three extending from second lateral incision, somewhat double row or group of from five to seven at about the middle point of the side of the pygidium, and a group of seven or eight at the basal or anterior lateral angle of the pygidium; the actual number of pores is greater, as shown by the presence of the internal secretory organs, namely, median one, first incision 3, second incision 5, the laterals 6-8 and anterior angle 8; basal thickenings not prominent, obscure; ventral thickenings normal and not much developed.

Type.—Bureau of Entomology, No. 14,185. On Japanese hemlock (*Tsuga* sp.), received from Dr. J. B. Smith, March 11, 1910, who collected it in the course of his quarantine work from stock imported from Japan.

From the specimens submitted, the plant is apparently heavily infested, chiefly on the underside of the leaflets. The condition indicates a scale pest capable of doing much damage.

This scale insect is a good example of the difficulties met with in attempting to subdivide the old and unwieldy genus *Aspidiotus* into subgenera. The character of the lobes, the prominent serrated, or toothed, projection laterad of the lobes, and large anal opening remind one very much of the species of *Aspidiotus* (s. str.) which infest pines. It comes, in fact, very close to the Chinese species described by the writer as *Aspidiotus meyeri*. The strong development, however, of the paraphyses is a feature found in none of the pine species referred to, and allies it with the genus (or subgenus) *Diaspidiotus*. The paraphyses seems to be a fairly definite and prominent character in *Diaspidiotus* and most of the genera or subgenera erected from the old genus *Aspidiotus*. In the case of *Aspidiotus* (s. str.), the paraphyses are reduced to mere points, or are practically wanting, but all gradations between this condition and well developed paraphyses are found, indicating plainly the entire artificiality of classification based on this character. In

this instance we have a species which is evidently closely related to other pine species, perhaps even being a mere variety, but on this character would fall in a different subgenus. The absence of plates laterad of the serrated lobe may be due simply to age and wear, as is undoubtedly also the short and rounded condition of the two median pairs of lobes. The differences, however, in the plates, lobes, lateral serrated projection, and especially in the paraphyses, warrant, in connection with the difference in habitat, assigning a new name to this form.

Orthoptera of North Carolina.

By F. SHERMAN, JR., and C. S. BRIMLEY, Raleigh, N. C.

The following list includes some records of Orthoptera, known by the authors to occur in North Carolina. When sufficient data are available to ascertain distribution this is indicated by such terms as "whole state," "mountains," "eastern section," etc. Where we have only a few scattered records, the localities are specified. We have not included dates of capture, but can supply them to interested persons on request.

In addition to the authors, persons who have made material contributions to our knowledge of the Orthoptera of the state are: Professor A. P. Morse, Wellesley College, Mass.; Mr. G. M. Bentley, Knoxville, Tenn., and Mr. R. S. Woglum, of the U. S. Bureau of Entomology,—the last two having both been engaged in entomological work in this state in former years; and Messrs. Rehn and Hebard, of Philadelphia.*

We have arranged the *families* in the usual recognized sequence, the *genera* alphabetically in each family, and the *species* alphabetically in each genus.

The paper is compiled from the card catalogue of the Division of Entomology, N. C. State Department of Agriculture, at Raleigh.

*At the time this article was written, the authors had not seen Messrs. Rehn and Hebard's very valuable article on the Orthoptera of North Carolina, entitled "Preliminary Studies of North Carolina Orthoptera" (Proc. Acad. Nat. Sci. Phil. Nov. 1910), and hence have omitted a number of species included by these gentlemen.

FAMILY FORFICULIDAE.

- Anisolabis azteca* Dohrn; whole State.
Labia burgessi Scudder; Raleigh, Boardman.
Labia minor Linn; Raleigh, Newton.
Labidura riparia Pallas; Raleigh.
Spongophora brunneipennis Serv.; Raleigh, Cape Hatteras.

FAMILY BLATTIDAE.

- Blatta orientalis* Linn; Raleigh, LaGrange.
Blattella germanica Linn; Raleigh.
Ceratinoptera lutea S. & Z.; Raleigh Havelock.
Cryptocercus punctulatus Scudder; Mountain region.
Ischnoptera bolliana S. & Z.; Raleigh.
Ischnoptera couloumiana Sauss.; Raleigh, Southern Pines.
Ischnoptera deropeltiformis Brun.; Raleigh, Blantyre.
Ischnoptera divisa S. & Z.; Eastern section.
Ischnoptera johnsoni Rehn; Raleigh, Andrews.
Ischnoptera uhleriana Sauss.; Whole State.
Periplaneta americana Linn; Raleigh, Washington.

FAMILY MANTIDAE.

- Stagmomantis carolina* Linn.; Raleigh, Greensboro, Southern Pines.

, FAMILY PHASMIDAE.

- Diapheromera femorata* Say; Raleigh, Southern Pines.

FAMILY ACRIDIDAE.

- Acrydium granulatum* Kirby; Mountains.
Acrydium hancocki Morse; Mountains.
Acrydium obscurum Hanck; Whole State.
Acrydium ornatum Say; Salisbury to Mountains.
Amblytropidia occidentalis Sauss.; Eastern section.
Arnilla chlorizans Walker; Lake Ellis.
Arphia sulphurea Fabr.; Whole State.
Arphia xanthoptera Germ.; Whole State.
Climocephalus elegans Morse; Beaufort.
Climocephalus pulcher Rehn and Hebard; Southport.
Chloaltis conspersa Harris; Mountains.
Chorthippus curtispennis Harris; Mountains.
Chorthippa viridifasciata DeG.; Whole State.
Dictyophorus reticulatus Thunb.; Cabarrus County.
Dissosteira carolina L.; Whole State.
Dichromorpha viridis Scudd.; Central section.
Encoptolophus sordidus Burm.; Mountains.

- Eritettix simplex* Scudd.; Hendersonville, Raleigh, Southern Pines.
Hippiscus apiculatus Harris; Mountains.
Hippiscus phoenicopterus Germ.; Whole State.
Hippiscus rugosus Scudd.; Whole State.
Leptysmia marginicollis Serv.; Eastern section.
Melanoplus amplexans Scudd.; Mountains.
Melanoplus arboreus Scudd.; Southern Pines.
Melanoplus atlantis Riley; Whole State.
Melanoplus deceptus Morse; Mountains.
Melanoplus decoratus Morse; Mountains.
Melanoplus divergens Morse; Mountains.
Melanoplus devius Morse; Mountains.
Melanoplus femoratus Burm.; Raleigh to Mountains.
Melanoplus femur-rubrum DeG.; Whole State.
Melanoplus impudicus Scudd.; Mountains.
Melanoplus keeleri Scudd.; Eastern section.
Melanoplus luridus Dodge; Mountains.
Melanoplus minor Scudd.; Eastern section.
Melanoplus punctulatus Uhler; Raleigh, Blantyre.
Melanoplus scudderi Uhler; Raleigh and westward.
Melanoplus similis Morse; Mountains.
Melanoplus strumosus Morse; Eastern section.
Melanoplus sylvestris Morse; Mountains.
Melanoplus tribulus Morse; Mountains.
Mermiria alacris Scudd.; Southern Pines.
Mermiria bivittata Serv.; Havelock.
Mermiria intertexta Scudd.; Smith's Island.
Neotettix bolivari Hanc.; Whole State.
Nomotettix compressus Morse; Whole State.
Nomotettix cristatus Scudd.; Whole State.
Orphulella pelidna Burm.; Whole State.
Orphulella speciosa Scudd.; Linville.
Paratettix cucullatus Burm.; Whole State.
Paratettix mexicanus Sauss.; North Carolina.
Paroxya floridana Thomas; Whole State.
Paroxya scudderi Blatchley; Southern Pines.
Podisma glacialis variegata Scudd.; Mountains.
Psinidia fenestralis Serv.; Whole State.
Schistocerca alutacea Harris; Eastern section.
Schistocerca americana Drury; Whole State.
Schistocerca damnifica Sauss.; Whole State.
Schistocerca rubiginosa Scudd.; Southport, Southern Pines and Graham County.

Scirictica picta Scudd.; Eastern section.
Spharagemon collaris wyomingianum H.; Eastern section.
Spharagemon bolli Scudd.; Mountains east to Raleigh.
Syrbula admirabilis Uhl.; Whole State.
Tettigidea armata Morse; Boardman.
Tettigidea lateralis Say.; Whole State.
Tettigidea prorsa Scudd.; N. C.
Trimerotropis citrina Scudd.; Whole State.
Trimerotropis maritima Harris; Coast.
Trimerotropis citrina \times *maritima*; Southern Pines, Enfield.
Truxalis brevicornis Linn.; Raleigh and westward.

FAMILY TETTIGONIIDAE.

Amblycorypha rotundifolia Scudder; Southern Pines, Blowing Rock and Waynesville.
Amblycorypha oblongifolia DeG.; Eastern section.
Amblycorypha uhleri Stal; Raleigh, Charlotte.
Atlanticus dorsalis Burm.; Southern Pines, Andrews and Waynesville.
Atlanticus pachymerus Burm.; Eastern section.
Camptonotus carolinensis Gerst.; Raleigh.
Ceuthophilus gracilipes Hald; Mountains.
Ceuthophilus heros Scudd.; Blowing Rock.
Ceuthophilus spinosus Scudd.; Southern Pines.
Ceuthophilus tenebrarum Scudd.; Southern Pines, Andrews, Grandfather Mountain.
Ceuthophilus uhleri Scudder; Raleigh.
Conocephalus brevipennis Scudd.; Raleigh, Beaufort.
Conocephalus ensiferus Scudd.; Whole State.
Conocephalus fasciatus DeG.; Whole State.
Conocephalus saltans Scudd.; Raleigh, Hamlet, Southern Pines.
Conocephalus strictus Scudd.; Raleigh.
Cyrtophyllus perspicillatus L.; Raleigh and westward.
Neoconocephalus atlanticus Brun.; Raleigh.
Neoconocephalus bruneri Blatchley; Raleigh.
Neoconocephalus crepitans Scudder; Raleigh.
Neoconocephalus ensiger Harris; Blowing Rock.
Neoconocephalus fuscostriatus Redt.; Raleigh, Pantego.
Neoconocephalus hoplomachus Rehn and Hebard; Wilmington.
Neoconocephalus mexicanus Sauss.; Raleigh, Smith's Island.
Neoconocephalus palustris Blatchley; Raleigh.
Neoconocephalus robustus Scudder; Raleigh.
Microcentrum rhombifolium Sauss.; Central section.
Microcentrum retinerve Riley; Stokes County.

Orchelimum agile DeG.; Mountains to Raleigh.
Orchelimum glaberrimum Burm.; Raleigh.
Orchelimum herbaceum Serv.; Smith's Island.
Orchelimum nigripes Scudd.; Raleigh.
Orchelimum nitidum Redt.; Eastern half of State.
Orchelimum volantum McNeill; Wilmington.
Pyrgocorypha uncinata Harr.; Raleigh.
Scudderia cuneata Morse; Raleigh, Highlands.
Scudderia curvicauda DeG.; Raleigh and westward.
Scudderia furcata Brunn.; Raleigh and westward.
Scudderia texensis Sauss.; Raleigh and eastward.
Symmetropleura modesta Brunn.; Raleigh, Southern Pines.

FAMILY GRYLLIDAE.

Anaxipha exigua Say.; Raleigh, Alamance County.
Aurogryllus muticus DeG.; Eastern section.
Cycloptilus americanus Sauss.; Raleigh and Alamance County.
Cycloptilus squamosus Scudd.; Raleigh, Beaufort.
Cyrtoxipha delicatula Scudd.; Raleigh and Granville County.
Ellipes minuta Scudd.; Raleigh and Southern Mountains.
Gryllotalpa borealis Burm.; Raleigh and westward.
Gryllus abbreviatus Serv.
Gryllus assimilis Fab.; Southeast.
Gryllus firmus Scudd.; Goldsboro, Southern Pines.
Gryllus pennsylvanicus Burm.; Whole State.
Gryllus rubens Scudd.; Raleigh.
Hapithus agitator Uhler; Raleigh.
Miogryllus saussurei Scudd.; Pantego, Hendersonville, Raleigh.
Myrmecophila pergandei Bruner; Raleigh, Hendersonville.
Nemobius canus Scudd.; Raleigh.
Nemobius carolinus Scudd.; Raleigh westward.
Nemobius confusus Blatchley; Raleigh.
Nemobius cubensis Sauss.; Raleigh
Nemobius fasciatus DeG.; Mountains.
Nemobius fasciatus socius Scudd.; Raleigh eastward.
Nemobius maculatus Blatch.; Raleigh, Jefferson.
Oecanthus angustipennis Fitch; Raleigh westward.
Oecanthus exclamationis Davis; Raleigh.
Oecanthus latipennis Riley; Raleigh and westward.
Oecanthus nigricornis Walker; Mountains, Raleigh.
Oecanthus quadripunctatus Beut.; Whole State.
Orocharis saltator Uhler; Raleigh, Southern Pines.

Phylloscyrtus pulchellus Uhler; Waynesville, Raleigh and Granville County.

Xabea bipunctata (DeG.); Blantyre.

Summary,—Orthoptera of North Carolina.

Family, Forficulidae	5 species
Family, Blattidae	11 species
Family, Mantidae	1 species
Family, Phasmidae	1 species
Family, Acrididae	69 species
Family, Tettigonidae	40 species
Family, Gryllidae	30 species

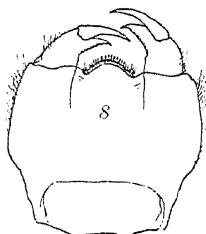
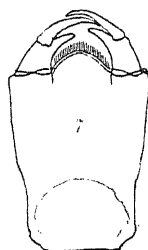
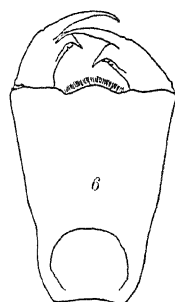
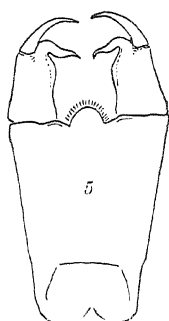
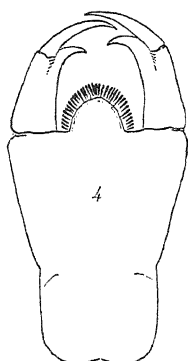
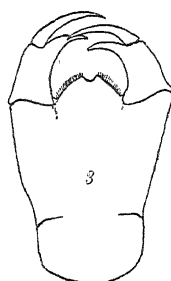
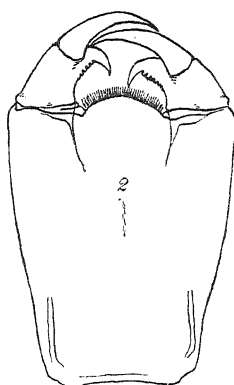
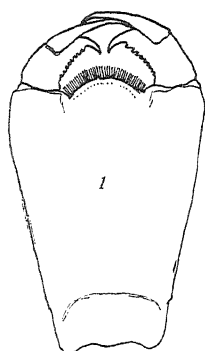
Total 157 species

Notes on some Nymphs of Gomphinae (Order Odonata) of the Hagen Collection.

BY JAMES G. NEEDHAM, Cornell University, Ithaca, New York.

(Plate XIV.)

In 1904, while examining the dragonfly nymphs of the Hagen collection in the Museum of Comparative Zoology at Cambridge, I made some drawings and determinations of Gomphine nymphs which, upon Dr. Calvert's invitation, I now publish herewith. The figures are all of the nymphal labia. Cabot's excellent figures of the nymphs of his first paper (Immature stages of the Odonata, part I, Subfamily Gomphina. Mem. Mus. Comp. Zool. vol. II, No. 5, pp. 1-17, pls. I-III, 1872) are not sufficiently detailed as to labial structures to meet the descriptive needs of the present day. Hagen's later descriptions (Monograph of the earlier stages of the Odonata. Subfamilies Gomphina and Cordulegastrina. Trans. Amer. Ent. Soc., vol. 12., pp. 249-291, 1885) were not accompanied by figures. Furthermore, it was a discovery of a later day that undetermined nymphs might be referred to their proper genera by comparison of the developing venation of the nymphal wing with the venation of the adult. Therefore, it is possible to add something to the



GOMPHINE NYMPHS—NEEDHAM.

knowledge left us by Cabot and Hagen by a re-examination of these interesting nymphs. The labial figures and descriptive notes offered herewith are to be considered as supplemental to Hagen's monograph, above cited.

Figure 1 is the labium of the nymph No. 1 of Cabot (l. c. Pl. 1, fig. 2) and No. 29 of Hagen (l. c., p. 272). It bears the M. C. Z. No. 443. It was at first referred doubtfully (Cabot l. c.) to *Herpetogomphus*, and later (Hagen l. c.) to *Epigomphus*. An examination of the venation of the developing wings reveals that it cannot belong to either of these genera, but it is probably a member of the not very homogeneous genus *Gomphoides* Selys (recently renamed *Negomphoides*) by Muttkowski (Bull. Mus. Milwaukee, vol. 1, p. 81, 1910).. The triangle of the forewing is three-celled, and the subtriangle is four-celled, there being two cells across the proximal end of it and two cells successively following, one triangular cell occupying its apex. The first and seventh antenodals are hypertrophied; ante- and post-nodals are 20 and 15, respectively. There is a strong brace vein to the inner end of the stigma, followed by five cross veins behind the stigma. There are seven cross veins at the bridge, one at the subnodus, four before it and two beyond it.

The labium of this nymph differs from that of *Gomphoides stigmatus* (Proc. U. S. Nat. Mus., vol. 27, p. 687, pl. 43, fig. 1, 1904) in having a slightly longer end hook upon the lateral lobe of the labium, and in having at the front margin of the rounded middle lobe, hidden among the bases of the fringing flattened hairs, two minute brown denticles. Probably here as in the better known genus *Gomphus*, the presence or absence of such denticles is merely a matter of specific difference.

Figure 2 is the labium of another species of *Gomphoides*, represented in the collection by a fragment of a cast nymphal skin. I was not able to identify it with any of the better preserved forms described by Hagen. The M. C. Z. number it bears is 436 and it bears the further label "Tapajos River, Brazil, Thayer Expedition, 1885."

The total length of the nymph would be about 23 mm.; the nine segments of the abdomen remaining measure 14 mm., segment 10 and the appendages being missing. The fore and middle legs are equi-distant at the base, the tibiae are without burrowing hooks, the wing cases reach posteriorly to the middle of the fourth abdominal segment, there are sharp thorn-like lateral spines on abdominal segments 5-9, slightly increasing in length posteriorly, those of the 9th segment being about one-eighth as long as the body of that segment. There are dorsal hooks on segments 3-9, slightly diminishing in size posteriorly and becoming declined at their tips. The head is crushed and broken.

The labium of this species lacks the pair of brown denticles of the preceding species, but has the end hooks of similar form, larger than in *G. stigmatus*.

Figure 3 is the labium of Cabot's nymph No. 7, which was also Hagen's No. 28. The specimens were obtained from Ghugger Pir, Himalaya, India, through Rev. M. M. Carleton. They were referred by supposition to *Cyclogomphus*, and an examination of the developing venation, which is well preserved, confirms the supposition.

The shallow median cleft in the middle lobe of the labium, seems now less unique than when first described, since I have described two forms with deeper division of it: *Phyllogomphus* (Proc. U. S. Nat. Mus. vol. 37, pl. 38, fig. 2) and *Gomphus dilatatus* (Bull. 68, N. Y. State Mus. p. 266, fig. 14). These three forms, however, have no near likeness to each other.

Figure 4 is the labium of the nymph that was Cabot's No. 11, which was also Hagen's No. 34 (l. c. p. 277). While labeling it "*Gomphoides* sp.," Hagen doubtfully refers it (or, at least the preceding very closely allied species No. 33) to *Cyclophylla*; and an examination of the developing venation shows that to that genus it undoubtedly belongs.

There is in each wing a single cross vein in the supertriangle; there is one in the triangle, but there is none in the subtriangle. There is an anal loop of two cells placed crosswise of the wing: the outer side of the triangle of the hind wing is angulated above the middle of its length, and all other characters are sufficiently in accord with the typical species of this genus.

The labium is remarkable for the semicircular outline of the middle lobe, and for the long fringe of flattened scales about its margin. The end hook of the lateral lobes is sharply incurved, the inner margin is smooth.

Figure 5 is the labium of an undescribed fragment of a nymphal moult, found in the bottom of a bottle with other specimens that were labeled "Tapajos River, Brazil, 1885." There was hardly more than the labium present, and nothing fit for description save the labium, but that is of so remarkable form, that it is worthy to be made known even though at present unidentifiable. Clearly it is allied with *Cyclophylla* by the form of the median lobe, but the sigmoid-uncinate end hooks of the lateral labial lobes are without a parallel among described forms.

Fig. 6 represents the labium of Hagen's *Gomphus* No. 14 (l. c., p. 262). It comes from Cairo, Ill., and has since been redescribed in Bull. Ill. State Lab. Nat. Hist. vol. 6, p. 82, 1901. It is clearly a *Gomphus*, and is chiefly interesting for the differences shown by the labium from other known members of that genus. The sharp straight end hook is set at a right angle with the body of the lobe, and close up under it are two or three teeth on the inner margin. It remains specifically undeterminable.

Figure 7 represents the labium of *Onychogomphus lineatus*, raised by Rev. M. M. Carleton, at Delhi, India, and determined by Hagen.. The labium is much like the labia of the closely allied and better known nymphs of *Ophiogomphus* and *Herpetogomphus* in having the middle lobe broadly rounded and the lateral lobes blunt and not pointed on the ends, but the terminal third of the lateral lobe is slenderer in *Onychogomphus* than in the other two genera.

Figure 8 represents the labium of an undetermined species of *Ictinus* from Middle Himalaya, India. Hagen had no doubt of the identity of the genus, nor have I, though there is no venational evidence to prove it. The labium is remarkably short and broad, the lateral lobes are pointed and serrate-toothed within, and the rounded middle lobe is fringed with a series of spines so remarkable in form that I have represented a few of them enlarged in figure 9.

A word or two may be added concerning the identity of two other nymphs described by Hagen. His *Gomphus* No. 2 (l. c.

p. 254) which he thought might perhaps "belong to some of the large Indian species, *Macrogomphus* or *Heterogomphus*" appears to agree well in venation with adult *Macrogomphus* in the Museum of Comparative Zoology. The following venational characters should enable any one with adequate material to determine (I have no specimen of *Macrogomphus* now in my possession). There is a basal subcostal cross vein, and the hypertrophied antenodals are the first and fifth in the fore wing and the first and sixth or seventh in the hind wing. There are no cross veins in any of the triangles, but there are three medio-cubital cross veins in the fore wing—two before the one forming the inner side of the subtriangle. Ante- and post-nodals are 16:12 and 14:11 in fore and hind wing, respectively. There is a semi-circular, *Ophiogomphus*-like anal loop of two cells, with the cells of the anal margin before it irregular, and beyond it regularly arranged in double rows between the straight rear sectors.

Hagen's "*Ophiogomphus*" No. 10 can hardly belong to the genus *Ophiogomphus*, for the nymphal venation shows that the anal loop is composed of a single subquadrate cell, elongate in the axis of the wing and with parallel front and rear sides. The nymph also differs from the typical members of the genus in (a) absence of lateral spines from the abdominal segments, (b) in the flange that is developed upon the sides of the hind angles of the head, (c) in the spatulate flattening of the third antennal segment toward its tip, and the insertion of the minute fourth segment upon the inner angle of the tip, (d) in the straightness of the lateral lobe of the labium, and (e) in the length of the tenth abdominal segment, it being hardly shorter than the ninth segment.

EXPLANATION OF PLATE XIV.—Labia of Gomphine nymphs. In all, the inner aspect of the mentum, and parts distal thereto, are shown.

Fig. 1. *Gomphoides* species. Brazil.

Fig. 2. *Gomphoides* species. Brazil.

Fig. 3. *Cyclogomphus* species. India.

Fig. 4. Unknown genus. Brazil.

Fig. 5. *Cyclophylla* species. Brazil.

Fig. 6. *Gomphus* species. Illinois.

Fig. 7. *Onychogomphus lineatus*. India.

Fig. 8. *Ictinus* species. India.

Fig. 9. Part of the spinulose border of the middle lobe of the same.

Notes on *Nephelodes* Guen. (Lepid.).

By F. H. WOLLEY DOD, Millarville, Alta., Canada.

Of the three names standing as species of this genus in Prof. Smith's Check List, reference to *minians*, Guen. and *pectinatus*, Smith, are given in Dr. Dyar's catalogue. The type locality of *minians* I don't know, but it is believed to be eastern. *Pectinatus* was described from two males from Corfield, Vanc. I., and "B. C.," and said to resemble *minians*, but to differ in having the antennal branches longer and slightly thickened at the tip, and lacking bristles. Later Prof. Smith described *tertialis* from seven males and a female from Winnipeg, and stated that it was decidedly smaller than *minians*, with more even fringes, lacked an obvious median shade on the primaries, and differed in male genitalia (Journ. N. Y. E. S. xi. 19, 1903). The genitalia of all three species are figured on Plate III of Trans. Am. Ent. Soc. xxix, of the same year. Whether the differences shown indicate the existence of three biologically distinct species, is a matter for future investigation.

Sir George Hampson recognizes the genus, including in it besides our three names as species, two more from Tibet. These latter are by themselves in Section I. "Male antennæ bipectinate to apex, the branches long." Section II contains *tertialis* and *pectinata*, "male antennæ bipectinate with moderate branches with short bristle at extremity. The two he separates in a table thus, "Hind wing white, the terminal area tinged with brown . . . *tertialis*," and "Hind wing wholly suffused with brown . . . *pectinata*." He figures a male co-type of the former from Winnipeg, and mentions having a male from Colorado as well. Of *pectinatus* he gives a wood cut, listing four males and a female from Vancouver Island. Section III, "Antennæ of male bipectinate, with short branches with long bristle at extremity," is devoted to *emmedonia*, Cram., which, described in 1779, he makes a prior name to *minians* Guen., giving as other synonyms the names so standing in Smith's Catalogue, except that he removes *sobria* Walk., to a smooth-eyed genus in the next volume, and here

adds *Monosca subnotata* Walker, a change which Prof. Smith accepts. He makes *violans* Guen., of which he has a type from "Eastern States" "Ab. 1 * * * more purple, and without the red tones." He shows a wood cut of the species, but in it the antennal branches appear longer, and the bristles shorter, than in the cut of *pectinata* on the opposite page, in contradiction to the tables. In fact, in his detail of *pectinata* the antennal branches are shorter and bristles proportionately much longer, than in any B. C. specimen that I have seen.

In Can. Ent. XXXVII, 179-180, May, 1905, I published a somewhat extensive note on these forms, in which some antennal variation was suggested, and stating that my only Winnipeg specimen of authentic *tertialis* was inseparable from some Eastern specimens superficially.

When at Prof. Smith's collection I noted a male and female type and male co-type of *tertialis*, and wrote: "Pectinations longer than *minians*, and as long as *pectinatus*, with bristles as in *minians*. A very good species." And later at Washington, I wrote of a male co-type and another Winnipeg male, "Antennæ bipectinate with long branches as in *pectinatus*, but bristle longer than in *pectinatus*, not as long as *minians*." My conclusion as to the validity of the species was based solely upon the antennal structure. Whilst with Mr. Wallis at Winnipeg a few weeks before, I had noted that from an examination of the antennæ of his *Nephelodes* it seemed he might have more than one species. And at Rutgers College and other collections I frequently noticed, in several other genera, rather striking different relative lengths of antennal serrations or pectinations in specimens which appeared otherwise exactly alike, and called Prof. Smith's attention to it. The length of serrations or pectinations is often, undeniably, a valuable aid in separating closely allied species. But in the case of *Nephelodes*, as in some others, I gradually became very suspicious. At my request Mr. Wallis kindly sent me all his material in this genus for study. Most, as he regretted, were in bad condition, but served my purpose perfectly well. These, added to my own material from various localities totalled 59 males and 15 fe-

males, over which I spent an entire day, chiefly examining and most carefully comparing the antennal branches and bristles.

Four males from New Brighton, Pa., are the largest and brightest colored that I have from anywhere east of the Rockies. These have antennal branches about the length of the width of the shaft, narrowly stalked, though, except in one specimen, slightly enlarged at tips, from which spring single bristles about equal in length to the branches.

Nine from Chicago show a gradation from branches not exceeding width of shaft, with bristles of equal length, the joints being well marked by branches being a little thickened at their bases, to others with branches longer than width of shaft, with joints of shaft not marked, and the branches uniform throughout their length, or else a little thickened at tips. In some the branches are as long as, or longer than, some Vancouver Island *pectinatus*, but less thickened at tips and with longer bristle. In others the branches are shorter than in the New Brighton specimens. Occasionally two bristles spring from the tip of a branch, one a little longer than the other, and the bristles are not always as long as the branches. Eight other males from scattered localities in Illinois, from Elmwood, R. I., and Sudbury, Ontario, show similar variation to the Chicago specimens. Such malformations occasionally occur as in other species with pectinate antennæ, as two branches being united by a membrane, or one springing from the stem of another.

Three from Winnipeg have pectinations of three different lengths. In one they are as short as in the New Brighton specimens, and the shortest from Chicago, with bristle as long or nearly as long as branch, and thickened at base rather than at tip. In the other two they are longer but of different lengths, in one as in the longest from Chicago, not thickened at base, with bristle not much more than half the length of branch, and a little, though not much longer than in *pectinatus* from Vancouver Island. The last two specimens are typical *tertialis*, and from type locality. Thirteen males from Husavick and Winnipeg Beach, close together and about 50

miles north of Winnipeg, show the same antennal variation, and grade easily through. The branches are usually slender and of about even thickness, but are sometimes thickened at bases, or slightly at tips. The bristles are usually, but not always shorter than the shortest in the Chicago examples.

Two from Aweme, Man., one from Regina, Sask., and seven from Calgary, all have branches considerably longer than width of shaft, but in some not a bit longer than in some Chicago and east coast specimens, though the bristles in all seem shorter. The tendency to a thickening at the base of branches seems to have diminished in these, and they are generally thickened at tips. Ten from Vancouver Island and two from Glenwood Springs, Colorado, do not differ from these in antennæ, but the Vancouver Island specimens, especially those from Duncans, are more robust, and darker in color throughout.

Excepting perhaps the strongly colored New Brighton specimens, there is little difference in the range of color and maculation between series from the different localities from the east and as far west as Winnipeg. Some of the more eastern specimens possess slightly scalloped margins, in a varying degree, and sometimes not at all. The tendency is less noticeable in Winnipeg specimens, in which a very distinct median shade is just as often present as in the others. Winnipeg specimens average distinctly smaller, as is quite usual with prairie forms, and there is a distinct tendency towards paler and more whitish secondaries. But this again is an evanescent character. In Alberta the colors usually run paler, and a pinkish or somewhat carneous suffusion is not unusual. On the whole, the color of the secondaries here is still a little paler. The palest specimen of any I have, both as to primaries and secondaries, is from Calgary, and, as it happens, one of the very darkest is from Winnipeg. My Colorado specimens resemble some from Calgary more closely than any others.

On Vancouver Island (*pectinatus*) the build is somewhat stouter than on the prairie, but scarcely more so than in the

east, if at all. The wings have a rougher appearance. Olivaceous and red shades predominate to the exclusion of purple, and the secondaries in all my specimens are almost uniformly dark fuscous, darker than in eastern specimens, and lack the bronzy sheen and pink fringes so often found there.

I recently sent Sir George Hampson a Calgary specimen as *pectinatus*. He commented that it was "*tertialis*, not *pectinatus*." In so far as the color is concerned he is perfectly correct, and I quite admit that the Calgary form is *tertialis*, which appears to me to intergrade with *emmedonia*. As to whether *pectinatus* is really a biologically distinct entity, not habitually interbreeding, somewhere or other, with the same form, that is to say, whether a distinct racial connection will not ultimately be found to exist between the extremes referred to in this article as North American specimens, is a matter of some doubt. What I have been able to observe from the data at my disposal suggests to me that they are not distinct. For the present, not being able to trace an actual connection through, and possessing no specimens from anywhere between Calgary and Victoria, I feel bound to leave the name *pectinatus* as it stands. I should mention that I have females from most of the above mentioned localities, and that they do not differ essentially from the males except in having minutely ciliate antennæ.

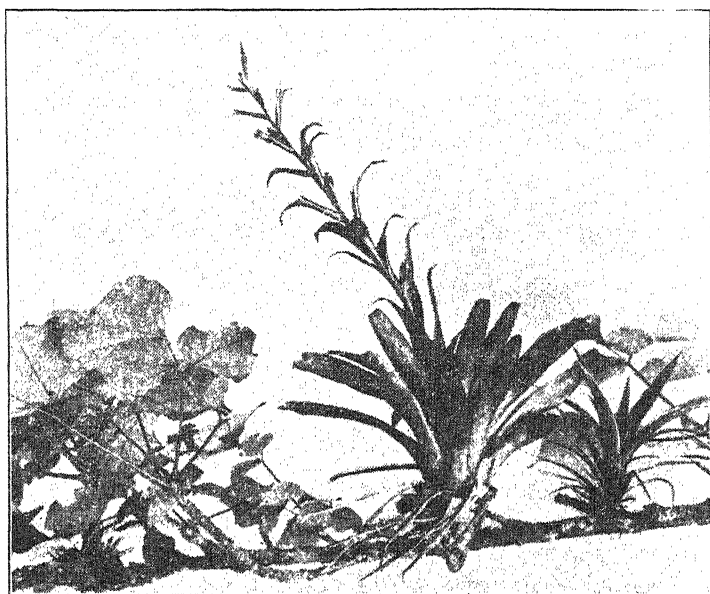
Of all the seventy-four specimens examined, I have discovered a single but unmistakable spine on a single hind tibia of two, one male and one female, from Husavick, Man. It is situate in both on the outside of the limb, in distance about midway between the two pairs of spurs. Though at present I have investigated very little in the matter, I know of a number of species in which the presence or absence of tibial spines is variable, but this is the first instance in which I have discovered any on tibiae of a hairy-eyed species. The only other hairy-eyed species in North America that is known to have spined tibiae is *Trichorthosia parallela*.

Studies on Costa Rican Odonata.

II.—The Habits of the Plant-dwelling Larva of *Mecistogaster modestus*.*

BY PHILIP P. CALVERT, PH. D.,
University of Pennsylvania, Philadelphia, Pa.

Announcement has already been made in the NEWS (Calvert 1910 *a* and *b*) and elsewhere (Ibid., 1909 *c*, 1911) of the discovery, in Mexico by Mr. F. Knab and in Costa Rica by the writer,



Two epiphytic Bromeliads on a branch of *Erythrina*, Cartago, Costa Rica, July 4, 1909.
Photograph by Amelia S. Calvert.

of Odonate larvæ living in the water which collects between the bases of the leaves of Bromeliads growing upon trees, and of the rearing of the imagos of *Mecistogaster modestus* Selys from these larvæ.

*Number I, on The Larva of *Cora*, was published in Entomological News XXII, pp. 49-64, plates II and III, February, 1911.

The pineapple is the most familiar example of this family of plants, although, of course, it is not an epiphyte. The epiphytic bromeliads of Costa Rica, in addition to the Tillandsiae, pertain to the genera *Androlepis*, *Aechmea*, *Billbergia* and *Pitcairnia*, according to Wercklé (1909). Their range is from sea-level to the craters of such volcanos as Irazu (11,000 feet, 3300 metres), but they are most abundant in the moister parts of the country. To the naturalist traveling along the usual route from Limón to San José, the most striking difference between the almost constantly moist Atlantic slope and the Pacific side, with its definite dry season, is the much greater number of bromeliad and other epiphytes on the former.

On the pruned trees of the poró (*Erythrina*) and other species which form the *cercas* or hedges, surrounding the fields and pastures near Cartago (Atlantic slope), bromeliads with leaves five to ten inches (12.5-25 cm.) in length are extremely abundant. They frequently but not invariably contain water and usually harbor some insects, especially Blattidæ, but they never furnished any Odonate larvæ, nor were imagos of *Mecistogaster* ever met at this altitude (4750 feet, 1450 metres), in our experience.

Epiphytic bromeliads of greater size (*i. e.*, with leaves two to three feet, 60-90 cm., long) occur in forests both below and above this elevation, but our collections of Odonate larvæ from them, as well as our observations of *Mecistogaster* adults, were made at altitudes lower than 3300 feet (1000 metres). The leaves of these plants spring from such a very short stock that their bases are close together and the blades of the leaves in contact with each other for several inches. As a general rule a number of stocks grow side by side on the same host tree, whose trunk or branch they may completely encircle, and as the stocks may be attached to each other it is not easy to separate one individual plant from its fellows. The leaves, with the length mentioned, taper from base to apex, diverge from their fellows and either stretch up stiffly for their entire length or droop over gracefully near their tips; owing to their stiff-

ness and their serrated spiny edges, they must be handled carefully to avoid scratched and bleeding hands. The stocks are attached to the host trees at very varying distances from the ground—from less than a foot to more than fifty feet (15 metres).

On account of the size and formidable defenses of these plants, it was our usual practice to select those whose attachment was not more than fifteen feet above the ground, throw a long rope over one or more stocks, pull on both ends of the rope so that it would slide between the tree trunk and the bromeliad and break the roots which fastened the latter to its host. Some water and some of the most active insect inhabitants of the epiphyte would be lost in this operation. As soon as the bromeliad reached the ground, it was placed with its crown of leaves directed upward and the upper parts of the leaves cut off with a knife to get rid of the inconvenience of the spines. Beginning with the outermost leaf of the whorl, the leaves were removed one by one, carefully stripping each to its attachment to the stock and taking out the animals lying between the leaf bases with a forceps and placing them in bottles.

The first time that I found bromeliadiculous Odonate larvæ was October 3, 1909, at Juan Viñas, Costa Rica. Three distinct clumps of epiphytic bromeliads had been examined without success that day, at different points along the road and trail which leads from the railroad station down to the iron bridge over the Rio Reventazon. To quote from our diary: "The fourth and last bromeliad was in the forest about 200 feet above the river and 10-12 feet above ground on a tree trunk. * * * After half an hour's tugging and pulling, the mass, consisting of three plants and weighing surely not less than fifty pounds, fell to the ground. I cut off the leaves as before and very soon found a dragonfly larva between the bases of two leaves not many leaves in from the circumference. In the hour I remained after the plants fell, no other larvæ were found and there was much still to be examined, so I left the plants where they had fallen. At 9 A. M. [Oct. 4] I resumed

cutting off leaves as before, and when I had removed all the larger ones I carried the three stocks, still so firmly united that I was unable to separate them with my little knife, and weighing fifteen pounds or more, to a spring farther down the canyon side so that I might wash out the mud when necessary to make more careful search. In all the bromeliads examined these two days there was much mud between the leaves, chiefly the outer ones, as well as dead leaves of trees which have fallen from the above or, perhaps at times, have been carried in by wind. At noon—after three hours' constant work—I finished the examination and had found two more dragonfly larvæ."

This clump of bromeliads was tenanted, in addition to the Odonate larvæ, by a young scorpion (*Centrurus margaritatus* Gerv.) two inches long, which had just moulted, the exuvia also found; two species of Phalangids (*Metergimus signatus* Bks., *Cynorta* sp.), a Pseudoscorpion (*Chelanops* sp.), and Coleoptera, both adults (*Metamasius dimidiatipennis* Jekel; *Allegoria dilatata* Castelnau; *Cryptobium* sp., or genus allied thereto; an Endomychid genus, new, near *Trochoideus*; *Cercyon* or *Phaenonotum* sp.; and *Phaenonotum tarsale* Sharp) and larvæ (Elaterids, probably of the genus *Semiotus* and others allied to what is considered the larva of *Dolopius*; a Lampyrid of an unknown genus, but apparently related to *Photuris*; a Sphæridid, possibly *Phaenonotum tarsale*) a Dipterous larva (Stratiomyid) with a circle of setæ at its hind end; two Heteroptera, the subglobular shiny *Chlaenocoris dissimilis* Dist. and a flat nymph of (probably) *Belminius rugulosus* Stal; a Hepialid caterpillar; a small earwig ("too immature to be determinable; probably it is a *Labia*, possibly *L. annulata* Fabr."); ants of an undescribed species of *Apterostigma*. The weevil, *Metamasius dimidiatipennis*, bore many Acari (a species of *Uropoda*) on its legs, and another larger Acarine (*Cclanopsis* sp.) was present between the leaves; finally in the mud between some of the leaves was a fair-sized earthworm (an immature *Andiodrilus biolleyi* Cog. di Mar.) quick in its move-

ments and with a peculiar smooth proboscis which was frequently thrust out and looked like a spine.*

Of all these inhabitants of the bromeliad, the Pseudoscorpion, the flat Reduviid *Belminus* and the Elaterid larvæ referred to *Semiotus* (?) appear to possess the most adaptive body form, *i. e.* flattened to correspond to the crevices between the broad leaf bases. This is best marked in the *Semiotus* (?) larvae which measured 1—1½ in. (25-40 mm.) long, one-quarter inch or more (5 + mm.) wide and less than one-eighth inch (< 3 mm.) in thickness.

The list here given of the cotenants with the Odonate larvæ does not include by any means all the *bromeliadicoli* which we met in Costa Rica, but is interesting as giving a glimpse of the organic environment of the special subject of this paper.

Again at Juan Viñas, on December 17, 1909, we pulled down a large epiphytic bromeliad from about 12 feet above ground, "although it took all our combined weight and strength to do it and were rewarded by finding seven or eight good specimens of Odonate larvæ of different sizes. This bromeliad had, among other animals, a few of the large black ants, *Odon-*

*Specimens of the bromeliadicoli were submitted to specialists and I acknowledge with thanks the identifications of the earthworm by Dr. J. Percy Moore, of the ants by Prof. W. M. Wheeler, of the earwig by Dr. Malcolm Burr (through Mr. J. A. G. Rehn), of the Arachnida by Mr. Nathan Banks, of the Coleoptera by Mr. E. A. Schwarz, of the Heteroptera by Mr. O. Heidemann and of the Lepidopterous larva by Dr. H. G. Dyar. The identification of the last four named groups was arranged by Mr. Frederick Knab, who himself determined the Stratiomyid larva.

Of the ant *Apterostigma* sp., Prof. Wheeler, after examining these specimens and also others from Costa Rica *not* collected in bromeliads, wrote: "It is a fungus growing ant of the most primitive and, at the present time, most interesting genus of Attii. No species of this genus has ever been taken in Bromeliads. All of the known species have been described from cavities in rotten wood where they build a peculiar fungus garden using caterpillar excrement as a substratum, and enveloping the whole garden in a mycelial web which is not known to exist in any of the other genera of Attiine ants." Since, as stated above, a caterpillar also lived in this same clump of bromeliads, doubtless the usual living conditions of *Apterostigma* were satisfied here.

tomachus hastatus Fabr., with enormously developed jaws, bent near the tip, which are carried wide open and measure one-quarter inch from tip to tip; occasionally they would be snapped shut with a very audible click."* We were by no means always successful, however, either in finding Odonate larvæ in bromeliads or in pulling down the plants from the trees, as records in our diary for La Emilia in November, 1909, and at Juan Viñas in February and March, 1910, show. Our last collection from them was on April 26, 1910, when we examined clumps of bromeliads on trees near the edge of a clearing about 100 feet below the railroad tracks west of Juan Viñas station, altitude about 3200 feet. Here we "found a few larvæ of *Mecistogaster* with the accompaniment of spiders, cockroaches, mosquitoes, slugs, planarians, earthworms and big-jawed ants." Among the *Mecistogaster* larvæ was one smaller than any we had previously found and I carelessly did not immediately separate it from its larger brethren; when I turned to do so it had disappeared, and we had no doubt that it had suffered from the cannibalistic habits of all its tribe.

The fate of our bromeliadiculous Odonate larvæ was as follows. The three of October 3-4, 1909, reached our headquarters at Cartago alive and were placed in separate glass tumblers, each containing a little water and a miniature bromeliad from the neighboring *cercas*. They were fed with, and were seen to eat, smaller dragonfly larvæ. The larva of Oct. 3 (No. 49) died in the act of moulting, Oct. 8, being unable to cast the skin from its head and especially the mask. One of those of Oct. 4 died from some unknown cause and its hinder parts were eaten by its companion before separation; the other (No. 48) moulted between Oct. 15 and 24, while we were absent, and again on Dec. 25, but died Dec. 30-31.

The larvæ obtained Dec. 17, 1909, were similarly arranged at

*Commenting on specimens of this species, Prof. Wheeler wrote: "I find in my collection a series of specimens taken in bromeliads at Alto de Serra in the Province of São Paulo, Brazil, by von Ihering. Apparently it has a habit of nesting in such places." We found it in a number of bromeliads in Costa Rica.

Cartago, but were supplied more often with Chironomid larvæ; they did not seem as voracious as most Odonate larvæ are. They were numbered 54 to 61. No. 54 died Jan. 3, 1910. No. 55, without further moulting, transformed April 6 as *Mecistogaster modestus* ♂. No. 56 died in attempted transformation April 11. No. 57 probably moulted Jan. 19-29 during our absence and transformed April 18 as *Mecistogaster modestus* ♀. No. 58 moulted and died Jan. 19-29. No. 59 moulted Dec. 25 and transformed April 4 as *Mecistogaster modestus* ♀. No. 60 probably moulted Feb. 15-18 during our absence, as fragments of an exuvia were found Feb. 19; moulted March 29-30 and was found dead April 3. No. 61 moulted Jan. 7-16 and again March 13-16 and was lost probably in the earthquake of May 4, as we have no record for it later than March 16.

The larvæ of April 26, 1910, (Nos. 1-3) were at once preserved in alcohol, as were the pre-metamorphic exuviae and the dead larvæ resulting from our collections of Oct. 3-4 and Dec. 17, but not all the exuviae have been available for the present study.

Our diary for April 28, 1910, at Juan Viñas, records: "We went down the road to the river [Reventazon] * * * At the bromeliad cluster* from which we obtained the larvæ on December 17 last, from which *Mecistogaster modestus* transformed in our room at Cartago this present month of April, a single male of this species was sitting on the tip of a leaf and was easily caught with the net. Before reaching this tree we passed another also with bromeliads of an apparently different species. Around these bromeliads two females of *M. modestus* were fluttering and alighting and altho' we did not see them making any motions of oviposition, one of them disappeared into the leaf bases as if she might be on such an errand. On the outside of one of the yard-long leaves, about six inches from the apex, was an exuvia of *modestus* which we were able to get." The diary for May 1, 1910, reads: "Went down to the Revent-

*In December we had pulled down some, but not all, of the stocks forming this cluster, leaving the others as a control.

azon. As I passed the cluster of bromeliads around which two females of *Mecistogaster modestus* were seen flying by us on Thursday, a female of this species was transforming on the outside of a leaf. I was able to secure both her and her exuvia [8.30-9 A. M.].” “All these observations show that in spite of their unnatural surroundings and perhaps lower temperature, our larvæ at Cartago were not retarded in their development as compared with their free relations in their native forest.”

The origin of the bromeliadiculous habit of the larvæ of *Mecistogaster modestus* may possibly be accounted for in the following manner. The majority of the species of *Mecistogaster* are South American and some of them occur along the Amazon, where also are the headquarters of the Bromeliaceæ (Wittmack 1888, p. 39). As is well known, “thousands of miles of forest” along this river are inundated in each wet season, so that a person “will travel through this forest for days, scraping against tree-trunks and stooping to pass beneath the leaves of prickly palms, now level with the water, though raised on stems forty feet high.” (Spruce, 1908, vol. I, p. 229; Wallace, 1853 etc., chap. vii). At such periods of high-water, epiphytes, whether of the Bromeliaceæ or of other families, would often be just at the water’s surface, or only slightly submerged, and would offer to Zygopterous Odonata quite ordinary and usual places for oviposition. An association with certain plants might thus be formed by *Mecistogaster* or its ancestors, which would persist even when the water-surface was much below the level of the epiphytes. Only such plants as could retain water for long periods of time (weeks and months) would permit the development of essentially aquatic larvæ and the water must be renewed from time to time. This last condition would prevent the survival of *Mecistogaster* wherever the rainfall was too intermittent. Once the association of this insect with bromeliads,† or any other suitable plant, were formed it might persist with the spread of the insect away from the regions of deep yearly inundation (the Amazon or elsewhere), where we conceive its

† It is suggestive that the legion *Pseudostigma* Selys, to which *Mecistogaster* belongs, and the Bromeliaceæ are confined to tropical America.

possible origin to have occurred, to the forest at Juan Viñas where the trees which harbored our larvæ were far, far above the highest flood marks of the Rio Reventazon. *M. modestus*, *M. ornatus* and *Megaloprepus cocculatus*, as we saw them in Costa Rica, usually fly above the underbrush and when disturbed, rise to a height of many feet above the ground.

The excessively long abdomen of the adults of *Mccistogaster* and its allies (*Megaloprepus*, *Microstigma*, *Pseudostigma*, *Anomisma*) may be a special adaptation to the life of their offspring in water-containing plants, since the abdomen of the larva of *M. modestus* is no longer, proportionally, than in other Agrioninæ. The space between the leaf of a bromeliad and the leaf next without decreases downward, and if *Mccistogaster's* eggs are deposited in the plant tissue in or near the contained water, in accordance with the general habit of the Zygoptera, it would often be necessary for the female to reach far down into crevices possibly too narrow to admit of the entrance of her thorax and wings. The long abdomen with the ovipositor near its hind end would therefore be of distinct advantage, and it will be a matter of great interest to ascertain, by future observations, if the lengths of abdomens seen in various members of the legion *Pseudostigma* of de Selys are correlated with peculiarities in length in the plants or other objects in which they oviposit.

(The larva and transformation of *M. modestus* will be described and figured in Number III of these Studies.)

Supplementary Note on Plant-dwelling Odonate Larvæ.—In addition to the records of plant-dwelling Odonate larvae already mentioned in the News (Calvert, 1910 b), Mr. Frederick Knab has called my attention to a paper by G. F. Leicester (1903), containing the following statements: "One of the most important breeding places [for mosquitoes] in the jungle is the water which collects in the bamboo, either in the stumps of old bamboo or in the cavities of fallen bamboos which in some cases have cracked in drying and allowed water to accumulate in them, or even in standing living bamboos in which some insect has bored a hole in the stem and allowed water to enter (p. 291).

* * * Other natural enemies [of mosquito larvae living in the same places, in addition to the carnivorous mosquito larvae *Megarhinus*] are the larvae of certain species of Agrionidae, Libellulidae and Chironomidae." (p. 292).

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IBID.—1910 *c*. Zoological Researches in Costa Rica. Old Penn Weekly Review of the University of Pennsylvania, IX, pp. 165-170. Nov. 12. With figure (p. 167) of the fully-expanded *Mecistogaster modestus* and its exuvia. The remarks on *Mecistogaster*, but not the figure, were reprinted in Entom. Mo. Mag. (2) XXII, pp. 17-18. Jan., 1911, under the title "Dragonflies breeding in rain-water collected at the leaf-bases of Bromeliads," with comments by G. C. Champion.

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A BROMELIADICOLOUS CADDIS-WORM.—*Alphos* of the article on bromeliadicolous dragon-fly larvae in this number of the News, the following item from a letter from Mr. K. J. Morton, of Edinburgh, Scotland, is of interest: "Longer ago than I care to think, Fritz Müller, amongst other curious habitations of Trichopterous larvae, sent me some caddis cases taken from the water present between the sheaths of Bromeliads found on trees in the primeval forest growth of Southern Brazil."

THE OCCURRENCE OF THE TRICHOGRAMMATID *Ufens niger* (Ashmead) in Texas.—Records concerning even the most common species of Trichogrammatidae are rare and it is meet therefore to publish the following: A single male specimen of *Ufens niger* (Ashmead) was captured by C. A. Hart at Brownsville, Texas, July 9, 1908, by sweeping grass. The specimen has been remounted in xylol-balsam from alcohol and deposited in the collections of the Illinois State Laboratory of Natural History, Urbana, Ill., as accession No. 45,113.—A. A. GIRAULT.

New Species or Sub-species of North American Butterflies (Lepid.).

By HENRY SKINNER, Philadelphia, Pa.

Eresia texana seminole n. subsp.

Male and female. Base of the primary wing fulvous, with a black ring containing a fulvous spot; in the discal cell outward is a large fulvous spot encircled with black and beyond this a black space with a yellow dot in the center; further toward the apex is a lunate fulvous spot. Below the cell, near the base are three fulvous dots. All the other spots on both wings are yellow; the mesial band on secondaries yellow, large and more nearly quadrate than in *texana*.

Described from two specimens (male and female) in the collection of the Academy of Natural Sciences of Philadelphia and a number of paratypes in the collection of the Georgia State Board of Entomology at Atlanta. The specimens were taken by Professor J. C. Bradley, at Bainbridge, Georgia, Sept. 17th. It is named from the aborigines that inhabited that district as suggested by Professor Bradley.

Pamphila sassacus dacotae n. subsp.

The stigma of *dacotae* is like that of *sassacus*, but the markings of the male in most specimens are nearly obsolete; the small black dash seen in *sassacus* beyond the stigma is wanting in *dacotae*. In color the new form is paler, and this in conjunction with the lack of maculation gives it a peculiar appearance. The female is more differentiated from *sassacus* than the male, being entirely fuscous; there are three small sub-apical spots, two at the end of the cell and two below these, and the latter in one specimen are translucent; further toward the outer margin are two more spots. There is a faint semi-circular band of spots in the center of the secondaries. All these spots are repeated on the underside.

Described from five specimens from Volga, South Dakota, and five from Grinnell, Iowa. Type locality Volga. The insect flies in July and August (July 16-21, Aug. 24th.)

Pamphila mystic pallida n. subsp.

Like the Eastern *mystic* but much paler in color, especially the fuscous border of the wings.

Described from a number of specimens of both sexes from Volga, South Dakota. Taken in July, from the 16th to the 25th.

***Pamphila sylvanoides utahensis* n. subsp.**

Larger and paler in color on the upper side than *sylvanoides*. Under side paler than the typical form with the maculations of the secondaries white. The color of the under side has a pronounced greenish tinge.

Type locality, Park City, Utah, July 20th. Also from Beaver Canyon, Idaho, July 23rd, and Grizzly Mountains, Colorado, July 2nd. This is a very distinct topomorph.

***Pamphila pawnee montana* n. subsp.**

Size and shape of *pawnee*, with same character of stigma but much darker in color, with a wide fuscous border to all the wings. Under side much darker than in *pawnee*, with a basal yellow dot on the secondaries and a row of five yellow spots outside of the center and parallel to the outer margin.

Described from eleven specimens from Colorado, taken by David Bruce. Only two specimens out of the lot have exact data; one says Chaffee County, 7500 feet alt., and the other Salida, May 21st, 7500 feet alt.

***Pamphila quinquemacula* n. sp.**

Male. Expands 21 mm. Upperside. Primaries fuscous with five very small, distinct white spots, three of them subapical, one below these and situated nearer to the outer margin, and one below the end of the discal cell. Secondaries fuscous and immaculate. Underside. Primaries as above; secondaries with two very distinct, comparatively large white spots, about an eighth inch apart, near the costal margin and about eight minute white points scattered across the central area of the wing.

Fringes, palpi and pectus white.

From one specimen taken at Las Cruces, New Mexico, probably taken by Prof. T. D. A. Cockerell. It is allied to *fusca* Grote and Robinson, and *osyka* Edwards. This is the smallest species so far found in the United States.

The types of all these new forms are in the Academy of Natural Sciences of Philadelphia.

Dr. Creighton Wellman, whose entomological work in tropical Africa will be recalled by readers of the NEWS, is now Director of the Laboratory of Tropical Medicine, at Tulane University, New Orleans, La.

Adelpha (Heterochroa) bredowi and californica (Lepidoptera).

By HENRY SKINNER, Philadelphia, Pa.

These two species have been considerably confused in the literature of the subject. Some authors have placed *californica* as a synonym and others have confused the two. I had never carefully studied them and had supposed that *californica* was only a slight race of *bredowi* without any constant character or characters to separate it. We lately received some specimens from Texas, collected by Mr. H. A. Wenzel, and in deciding which name to place them under, I was led to examine the material at my command, which consists of twenty-nine specimens from a number of localities.

Bredowi was described by Hubner, Zutr. Exot. Schmett. f. 825, 826. The Biologia Centrali-Americana gives the following distribution for it: Arizona; Chihuahua, Oaxaca, Mexico; San Geronimo, Polochic Valley, Santa Rosa in Vera Paz, Guatemala. *Limenitis eulalia* Doubl. Hew., Gen. Diurn. Lep. t. 36, f. 1 is placed as a synonym.

Heterochroa californica was described by Butler, Proc. Zool. Soc. Lond., 1865, p. 485, with the habit given as California. It is figured by Edwards in his Butt. Nth. Amer. 1. pl. 44, 1870, under the name *bredowi*. Mr. Edwards corrected this reference in his Catl. of 1884, and gives the habitat as Cal.; Ariz.; Nev. It is also figured in Holland's Butterfly Book and in Wright's Butterflies of the West Coast.

Godman and Salvin mention the *californica* of Butler in the Biologia and say several small differences serve to distinguish it from *bredowi*, the latter being recorded from Arizona, from specimens collected by Morrison. At the end of his description of *californica* Mr. Butler says it is closely allied to *bredowi* and then points out a number of differences between the two. Of these I have found but one that is constant in the specimens examined—"the basal upper half of the hind wing is crossed by an additional short orange band."

On the under side of the secondary wing there is a broad

white fascia, edged narrowly by a black line, and interior to this in the basal upper half wing, is a blue fascia narrowly lined with black, and still nearer the base is an orange brown fascia edged with black and the base of the wing is blue. In *californica* the first blue fascia is replaced in its lower half by an orange brown spot and this spot is separated on its lower half from the inner orange brown fascia by a blue space.

These maculations of the upper half of the hind wing basally are very marked and serve to sharply separate the two species. If intergrades occur I have not seen them.

Another character of moment is found in the border of the under side of both wings. In *bredowi* there are two rows of submarginal lunules; the outer ones narrow and the inner ones three times the width of the outer ones. In *californica* the outer row of lunules is absent or only faintly indicated.

None of the markings of the upper side of the wings serve to differentiate the two forms.

The following are the records: Four specimens of *californica* (presumably from California); four specimens from California (no exact data); one from the San Bernardino Mountains, Cal.; one from Los Angeles, Cal.; one from Tehachapi, Cal., July 6th; one from Havilah, Cal., June 17th; two from Ashland, Oregon, Sept. 7th and 30th.

Nine specimens of *bredowi*, Carr Canyon, Huachuca Mountains, Arizona, Aug., taken by myself; one from the City of Mexico and three taken by H. A. Wenzel in the Chisos Mountains, in southern Texas, July 22nd.

THE COTTON MOTH IN LARGE NUMBERS.—From September 23rd to the 26th, Philadelphia experienced a large flight of the cotton moth, *Aletia argillacea*. They swarmed in some parts of the city and hundreds were resting head down on the electric light poles and on plate glass windows of stores. There were many thousands of them and nearly all that I saw were in perfect condition as though just from the chrysalis. These moths are known to migrate in numbers, but it is quite strange if the great numbers seen here came from the cotton districts in the south. The moths in some places appeared to create considerable alarm, people thinking they would cause damage to plant life here.—HENRY SKINNER, Philadelphia.

On two Species of the Berytid genus *Capyella* Bredd. (Rhynch.).

By E. BERGROTH, Fitchburg, Mass.

Capyella novella n. sp.

Castaneous, frontal spine pale testaceous, apex of second and third antennal joint and female genital segments black, fourth antennal joint white with the apex fuscous.

Head with the anteocular part as long as the postocular part, seen from the side moderately sloping (45°) and obliquely truncate at apex, the tylus being straight; frontal spine rather long, slightly curved downwards; bucculae high, a little prominent apically; rostrum almost reaching hind coxae; antennae very much longer than the body, first joint as long as second and third together, passing middle of abdomen, its apical club elongate, second and third joints slightly thicker at apex, third twice longer than second, fourth shorter than second.

Thorax thickly and strongly punctate, more finely so on anterior lobe of pronotum, which is a little sunken and rounded posteriorly and less than half the length of the posterior lobe, pronotum with the sides a little rounded, slightly obtusely gibbous at the posterior angles, the median longitudinal elevated line not higher between the shoulders and abbreviated before the depressed truncate basal margin. Scutellum pointed and recurved at apex. Orificia reaching the level of the corium, the erect free apical process slightly sinuate at the tip. Hemelytra reaching apex of the penultimate dorsal segment. Wings not quite reaching middle of antepenultimate segment.

Abdomen beneath transversely strigulose, female genital segments recurved.

Legs with the apical club of the femora elongate, hind femora as long as first antennal joint, a little surpassing apex of abdomen (tarsi missing). Length, ♀ 10 mm.

West Africa (Assini).

Larger and darker than *C. malacaiplus* Stal, and distinguished by the very long third antennal joint, the much less elevated humeral angles of the pronotum, the posteriorly less elevated median pronotal ridge, and the almost uniformly colored, not black-speckled legs and first three antennal joints.

Capyella lobulata Bergr.

This species, described in 1909, has recently (1911) been re-described by Distant under the name *Metatropis tipularia*. Distant's type and the specimens described by me are from the same locality, Port Darwin, in N. W. Australia. In the genus *Metatropis* Fieb. the head has no frontal spine, the ocelli are more approximate, the orificia are not freely prominent upward at apex, etc.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, four weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.—Ed.

PHILADELPHIA, PA., NOVEMBER, 1911.

As the time for the annual meeting of the Entomological Society of America approaches, it may not be amiss to report some ideas lately expressed by two of its members discussing the Society.

The time at the disposal of the Society for its annual meeting is very brief. That time should be put to the best use. Therefore, it was held, that what the Society should chiefly attempt to do is:

To discuss and take appropriate action to elevate the standards of entomological work and writings.

To further the co-operation of entomologists in different parts of the country.

To increase the acquaintanceships, and to promote good fellowship, among the entomologists of America.

To represent the collective opinion of American Entomologists.

To discuss and formulate rules, regulations and recommendations concerning nomenclature, *nomina conservanda*, descriptions, methods of publication, and all other matters of entomological interest for adoption by International Congresses of Entomology and of Zoology and their Commissions.

To limit the papers read at the annual meetings to those of general interest and importance and to insist that every paper should be presented within a brief time, say ten or fifteen minutes.

Papers treating of details of taxonomy, of morphology, of anatomy, etc., without wide application, should be given before the local entomological societies whose more frequent meetings provide time for adequate presentation.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

PRESERVATIVES AGAINST THE ATTACKS OF DERMESTIDS.—The German Entomological Society held a discussion on this topic at its meeting of March 13, 1911, of which the following is a translation from *Deutsche Entom. Zeitschrift*, 1911, pp. 350-1. Höfig showed some larvae and adults of a species of *Dermestes* which had arrived alive in an invoice of cat gut strings prepared with naphthaline from Australia. The material had been totally destroyed by these beetles. The speaker asked if any of the members knew of a radically effective means against the *Dermestes* plague. Ohaus remarked that, from his earlier experience as a ship's surgeon, naphthaline was not a means for killing Dermestids if the material in question, skins, feathers, etc., had already been infected with the larvae or eggs of *Dermestes* before treatment with naphthaline. He recommended carbon bisulphide as a good annihilator. Harms said that sprinkling with anise powder was a radical means of destruction. Bertling advised the sending of raw materials in liquids to avoid injury from *Dermestes*. Ohaus mentioned that in the rainless regions of South America carcasses of animals, etc., are almost exclusively visited by *Dermestes vulpinus* in countless numbers. Along with *Dermestes*, *Trox suberosus* and *Corynetes* sometimes appear in quantities. In almost all cases of injury *D. vulpinus* comes in question as Prof. Kolbe had determined in the case cited by Höfig.

ON THE USE OF THE GENUS ARANEUS CLERCK.—In the past few years several arachnologists, Simon, F. O. P. Cambridge, Strand, and some American authors have used the genus *Araneus* Cl. to replace *Epeira*. On the contrary I have held to *Epeira*, as it is supported by the various codes of nomenclature.

The case is very simple. *Araneus* or *Aranea* was not divided until 1804 when Latreille (Nouv. Dict.) created several genera at its ex-

pense. Latreille did not here give any types; he left in *Aranca* 3 species (although he did not account for all previous species).

Now F. O. P. Cambridge holds (Ann. Mag. Nat. Hist. (7) vol. VII, p. 61) that in mentioning only these three species under *Aranca* he thereby limits *Aranca* to them, and the type must be one of these three, instead of any of the numerous species originally under *Aranus*. This interpretation was somewhat warranted by the International Congress at Moscow in 1892, but it is not in any way warranted by the International Code now, the Boston meeting having distinctly ruled on methods of type-selection; nor is it supported by the Ornithologists' Code. The listing of species in genera does not in any way affect the selection of type. Any species originally in the genus is eligible as type, or according to some any not already types of other genera. From 1804 till 1810 there was no indication of type, but in 1810 Latreille (in Consid. gener.) gives as type of *Aranca*—*A. domestica*, an eligible species.

F. O. P. Cambridge held this invalid because *A. domestica* was not included by Latreille in *Aranca* in 1804 as one of the three species, but as shown above zoological rules do not accept the mere division of a genus without type-selection as affecting type-selection. Therefore if *Aranus* is to be used it has as its type *A. domestica*, and thus would replace *Tegenaria*, and not *Epeira*.

In 1806 Latreille gave *Aranca* with *Tegenaria* and *Agelena* as synonyms but without type-selection.

If Latreille in 1804 had mentioned but one species in *Aranca* it would not be the type, it must be stated to be the type.

According to rules the genus *Aranus* must be used; it cannot be discarded on the grounds given by Thorell and Sundevall.

It may be remarked that Lamarck in 1801 cites two species as representing *Aranca* (one *A. domestica*) so that he did not fix the type although some consider that where he gives but one species it is type-selection.—NATHAN BANKS, East Falls Church, Virginia.

MIGRATIONS OF DRAGONFLIES (ODONATA) AND OF ANTS (HYMEN).—

Under other cover, I send you a number of dragonflies, apparently of the same species. These with many others, I knocked down with my hat during their migration last evening [Sept. 2, 1911].

We have a cottage at the end of Cape May, near the new hotel, known as the eastern extension. Between us, the ocean, the thoroughfare and Sewell's Point there is nothing but a waste of newly filled-in sand and a few cottages; no ponds, pools or depressions.

I noticed the first of the flight about 5.45 P. M. in a few stragglers flying near the house, swiftly and in one direction, [which, from a sketch included in Mr. Wolf's letter was from northeast to southwest, the wind blowing at the time in the opposite direction]. Then they

came in augmented numbers, until they finally fairly catapulted by in thousands and tens of thousands without interruption until it became too dark any longer to see them.

From out-to-out the flight had a width of 486 paces, outside of this there were not even stragglers. Our house seemed to be the very center of the flight.

The flies flew near the ground and up as high as they could be distinguished, the greater number at about the level of the roof of our cottage. They moved at high speed and fairly streaked past, so that the eye would take in dozens at a time in looking forward or upward. At first it was difficult to hit any with a hat, but a short half-hour later they came in such great numbers that I struck many of them. It became dark before I picked them up, so missed many, which were blown away during the night. Many others were devoured by ants before I searched the ground this morning. Two of the mutilated I enclose in the package.

Prior to the appearance of the dragonflies my son and daughter passed through a flight of ants while on the trolley car on a run to Cape May Point, the other extreme of this settlement. They were of two sizes, small winged ants and others shaped like a wasp, but the size of a "yellow-jacket," and their flight was over the space from the Point Life-saving Station to the trestle below Cape May proper, a distance of over half a mile. My children report the air full of flying insects, so that passengers on the car were covered with them. The direction of their flight was also *against* the wind, but in an opposite direction to the later flight of the dragonflies, and probably a mile distant.

The swarm was followed by flocks of birds, sparrows, swallows, martins, etc.

The observers also stated that the migration seemed distinctly defined, and that on the trolley "everything was crawling with them." The observation was made at about 3.45 to 4 P. M.

I do not think that the two flights had any relation to each other.

My children brought home no ant specimens.—HERMAN T. WOLF, Cape May, New Jersey, Sept. 3, 1911.

[The dragonflies sent by Mr. Wolf as forming part of the swarm were all *Anax junius* Drury, 4 ♂♂, 4 ♀♀.—P. P. CALVERT.]

JELLY RAIN.—On the morning of Saturday, June 24, the ground here was found to be covered with small masses of jelly about as large as a pea. There had been heavy rain on Friday night, and it was raining at 7 a. m., when, so far as I can ascertain, the phenomenon was first seen. On being examined microscopically, the lumps of jelly turned out to contain numerous ova of some insect, with an advanced embryo in each. The egg itself is very minute—an elongated

oval 0.04 mm. in length. Yesterday and the day before many larvae emerged, and were obviously those of some species of *Chironomus*, though colorless, having no haemoglobin, as is the case with the larvae of *C. plumosus*. Not being an entomologist, I am at loss to understand how these egg-masses could have appeared where they did unless they were conveyed by the rain, as it does not seem likely that the midges would have laid their eggs on pavements, gravel paths, tombstones, etc., even had they been wet; nor has any large number of adult insect been seen in the locality. It would be interesting to hear whether the same thing was observed elsewhere, and whether the phenomenon often occurs. Showers of algae, small snails and even frogs have been recorded from time to time, but I cannot recall a like instance to the above.—M. D. HILL, Eton, Bucks, England, June 30 (*Nature*, July 6, 1911.)

AMERICAN ASSOCIATION OF ECONOMIC ENTOMOLOGISTS.—The twenty-fourth annual meeting will be held at Washington, D. C., December 27-29, 1911. Owing to the large attendance that is assured and to the numerous meetings which will be of interest to entomologists, an arrangement has been made so that the meetings of related societies will be held with as little conflict as possible.

The meeting of the Entomological Society of America will be held on Tuesday, December 26, and on the morning of the following day, December 27. The public lecture before that Society will be held Wednesday evening.

The first session of the meeting of the Association of Economic Entomologists will be held Wednesday at 1 P. M. At this time the annual address of the President, Prof. F. L. Washburn, of Minnesota, will be delivered and the opening business of the meeting transacted. The meeting will be continued on Thursday, morning and afternoon, and on Friday at 10 A. M. the closing session will be called to order.

The meeting of the American Association of Official Horticultural Inspectors will begin Thursday, December 28 at 8 P. M., and the sessions will be held Friday afternoon and evening and on Saturday should the length of the program warrant it.

An arrangement has been made whereby the December number of the *Journal of Economic Entomology* will be published earlier in that month than has been the custom in the past so that the members will receive it before the time of the meeting. The full program will appear in this issue and further details concerning hotel headquarters and other arrangements.

By vote of the Association at one of the recent meetings, members are requested to condense their papers so that the facts can be presented in fifteen minutes. In anticipation that the program will be crowded, it is suggested that members who may desire to submit more

than one paper at the meeting be requested to designate which paper they are most desirous of reading in order that the others may be read by title if the program renders this necessary. President Washburn has suggested that each member who presents a title for a paper be allowed to designate a member to lead the discussion, and it is desired that the name of the leader of the discussion on each paper be placed on the program. Each member who selects a leader to discuss a paper which he presents must make proper arrangements with the member selected. In order that the program may be made up for prompt publication in the Journal all titles of papers to be presented must be in the hands of the Secretary not later than November 10, 1911.

The attendance at the meeting promises to surpass all previous records, the advantages of Washington as an entomological center are unsurpassed and all members or visitors will be most welcome—F. L. WASHBURN, *President*, St. Anthony Park, Minn. A. F. BURGESS, *Secretary*, Melrose Highlands, Mass.

BUTTERFLIES OF MONTOUR COUNTY, PENNSYLVANIA (LEPID).—Following is a list of the butterflies as far as they have been collected in Montour County. Those marked (*) are listed from the collection of Dr. and Mrs. H. B. Meredith, of the Danville State Hospital for the Insane. Those marked (†) I have seen but not taken.

Anosia plexippus
Euptoieta claudia
Argynnis idalia
Argynnis cybele
Argynnis aphrodite
*Brenthis myrina**
Brenthis bellona
Melitaea phueton
Phyciodes tharos
Grapta interrogationis
*Grapta interrogationis fabrici**
Grapta interrogationis umbrosa
*Grapta comma dryas**
*Grapta comma harrisi**
Grapta progne
Vanessa j-album
Vanessa antiopa
Pyrameis atalanta
Pyrameis huntea
*Pyrameis cardui**
Basilarchia astyanax
Basilarchia arthemis lamina†
Basilarchia arthemis proserpina

Basilarchia disippus
Neonympha eurytus
*Neonympha sosybius**
Satyrus alope
Satyrus alope nephele
*Thecla melinus**
Thecla calanus
Thecla liparops
Feniseca tarquinius
Chrysophanus hypophlaeas
Lycæna pseudargiolus
*Lycæna pseudargiolus marginata**
*Lycæna pseudargiolus violacea**
*Lycæna pseudargiolus neglecta**
Lycæna comyntas
*Lycæna scudderi**
Pieris protodice
*Pieris napi**
Pieris rapæ
Colias philodice
Terias nicippe
Terias lisa
Papilio turnus

Papilio turnus glaucus
Papilio cresphontes†
Papilio asterias
Papilio troilus
Papilio philenor
Ephargyreus tityrus
Thorybes pylades
*Thorybes bathyllus**
Achalarus lycidas
Hesperia tesselata
Pholisora catullus
Thanaos brizo

*Thanaos lucilius**
Thanaos martialis
Ancyloxypha numitor
Erynnis leonardus
*Thymelicus brettus** (?)
*Atalopedes huron**
Polites peckius
Limochores taunus
Euphyes verna
Atrytone cabulon
Pamphila otho egeremet

REV. J. C. STAMM,
 Danville, Pa.

MR. A. F. PORTER, of Decorah, Iowa, and Mr. John M. Geddes, of Williamsport, Pa., have joined forces for an entomological collecting expedition to the Antilles and British Guiana. They are both very enthusiastic men and are looking forward to a successful trip. They will devote most of their time to Coleoptera and Lepidoptera.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), excluding Arachnida and Myriapoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted. This (*) following a record, denotes that the paper in question contains description of a new North American form.

For record of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

3—The American Naturalist. 4—The Canadian Entomologist.
 5—Psyche, Cambridge, Mass. 6—Journal, New York Entomological Society. 7—U. S. Department of Agriculture, Bureau of Entomology. 8—The Entomologist's Monthly Magazine, London.
 9—The Entomologist, London. 10—Nature, London. 11—Annals and Magazine of Natural History, London. 18—Ottawa Naturalist.
 22—Zoologischer Anzeiger, Leipzig. 28—Archives d'Anatomie Microscopique, Paris. 35—Annales, Societe Entomologique de Belgique.

37—*Le Naturaliste Canadien*, Quebec. 40—*Societas Entomologica*, Zurich. 42—*Journal*, Linnean Society, Zoology, London. 45—*Deutsche Entomologische Zeitschrift*. 49—*Annales historico-naturales Musei Nationalis Hungarici*, Budapest. 50—*Proceedings*, U. S. National Museum. 59—*Sitzungsberichte*, Gesellschaft der naturforschenden Freunde, Berlin. 68—*Science*, New York. 73—*Archives*, Zoologie Experimentale et Generale, Paris. 79—*La Nature*, Paris. 84—*Entomologische Rundschau*. 86—*Annales*, Societe Entomologique de France, Paris. 89—*Zoologische Jahrbucher*, Jena. 92—*Zeitschrift fur wissenschaftliche Insektenbiologie*. 97—*Zeitschrift fur wissenschaftliche Zoologie*, Leipzig. 105—*Videnskabelige Meddeleser*, Naturhistoriske Forening i Kjobenhaven. 119—*Archiv fur Naturgeschichte*, Berlin. 128—*Proceedings*, Linnean Society of New South Wales, Sidney. 152—*California Agricultural Experiment Station*, Berkeley. 160—*Internationale Revue der Gesamten Hydrobiologie und Hydrographie*, Leipzig. 166—*Internationale Entomologische Zeitschrift*, Guben. 169—*"Redia," R. Stazione di entomologia Agraria in Firenze*. 179—*Journal of Economic Entomology*. 180—*Annals*, Entomological Society of America. 186—*Journal of Economic Biology*, London. 189—*Pomona Journal of Entomology*, Claremont, Cal. 191—*Natur*, Munchen. 193—*Entomologische Blatter*, Nurnberg. 208—*Boletin*, Real Sociedad Espanola de Historia Natural, Madrid. 211—*Popular Science Monthly*, Lancaster, Pa. 216—*Entomologische Zeitschrift*, Stuttgart. 226—*Transactions*, Academy of Sciences of St. Louis. 230—*Revista*, Museo de la Plata, Buenos Aires. 234—*Records*, Indian Museum, Calcutta. 236—*Boletin*, Sociedad Aragonesa de Ciencias Naturales, Zaragoza. 238—*Anales*, Sociedad Cientifica Argentina, Buenos Aires. 239—*Annales*, Biologie Lacustre, Brussels. 240—*Maine Agricultural Experiment Station*, Orono. 243—*Yearbook*, Department of Agriculture, Washington, D. C. 277—*Victorian Naturalist*, Melbourne. 278—*Annales*, Societe Zoologique Suisse et du Museum d'Histoire de Geneve, Revue Suisse de Zoologie. 280—*Annals* Transvaal Museum, Pretoria. 281—*Annals of Tropical Medicine and Parasitology*, University of Liverpool, Series T. M. 286—*Archiv fur Mikroskopische Anatomie und Entwicklungsgeschichte*, Bonn. 305—*Deutsche Entomologische National-Bibliothek*, Berlin. 313—*Bulletin of Entomological Research*, London. 324—*Journal of Animal Behavior*, Cambridge, Mass. 332—*Bulletin of the Southern California Academy of Sciences*, Los Angeles. 336—*Board of Agriculture*, Trinidad. 340—*Transactions of the Linnean Society of London*, Zoology. 341—*Archiv fur Rassen- u. Gesellschafts-Biologie*, Leipzig. 342—*Pennsylvania Health Bulletin*, Harrisburg. 343—*Festschrift des Vereins*

fur Naturkunde zu Cassel. **344**—U. S. Department of Agriculture, Washington, D. C. **345**—Mittheilungen der Gesellschaft der Naturforscher in Kiew. **346**—Fauna Exotica, Mittheilungen aus dem Gebiete der exotischen Insektenwelt, Frankfurt am Main. **347**—Reports of the Local Government Board on Public Health and Medical Subjects (new series), London.

GENERAL SUBJECT. Anon.—Recent publications of economic entomology, **10**, 1911, 230-231. **Cockerell, T. D. A.**—Some suggested rules to govern entomological publications, **180**, iv, 192-193. **Cook, A. J.**—Three alarming insect pests, **189**, iii, 576-577. **Doane, R. W.**—Annotated list of the literature on insects and disease for the year 1910, **179**, iv, 386-398. **Emery, C.**—Instrument pour mesurer exactment les parties des insectes, **35**, 1911, 211-212. **Essig, O. E.**—The natural enemies of the citrus mealy bug IV, **189**, iii, 518-522. **Girault, A. A.**—Hosts of insect egg-parasites in No. and So. America, **5**, 1911, 146-153. **Goldi, E. A.**—Das die staatenbildung bei den insekten regulierende naturgesetz. **278**, 1911, 235-252. **Guppy, P. L.**—Insect notes for the year 1910-1911. **336**, Circ. No. 3, 1-14. **Heath, E. F.**—Collecting notes from Cartwright, Manitoba, **4**, 1911, 327. **Hewitt, C. G.**—The preparation of a catalogue of the insects of Canada, **4**, 1911, 273-275. The preparation of a catalogue of the insects of Canada, **18**, 1911, 83-86. **Hollande, A. C.**—L'autohemorrhée ou le rejet du sang chez les insectes (Toxicologie du sang), **28**, xiii, 171-318. **Howard & Fiske**—The importation into the U. S. of the parasites of the gipsy moth and the brown-tail moth, **7**, Bull. No. 91, 312 pp. **Jousset de Bellesme, Dr.**—L'aviation et les insectes, **79**, 1911, 276-281. **Kapzov, S.**—Untersuchungen ueber den feineren bau der Cuticula bei insekten, **79**, 1911, 296-337. **Maxwell-Lefroy, H.**—Nomenclature of economic insects, **186**, vi, 97-102. **Meek, C. F. V.**—The spermatogenesis of *Stenobothrus viridulus*; with special reference to the heterotropic chromosome as a sex determinant in grasshoppers, **42**, xxxii, 1-21. **Morgan, A. C.**—Insect enemies of tobacco in the U. S., **243**, 1910, 281-296. **Muttkowski, R. A.**—The composition of taxonomic papers, **180**, iv, 194-217. **Quayle, H. J.**—Citrus fruit insects, **152**, Bull. No. 214. **Rosenfeld, A. H.**—Insects and spiders in Spanish moss, **179**, iv, 389-409. **Schulz, H.**—Verzeichniss von Zooeciden aus dem Regierungs-Bezirk Cassel und angrenzenden gebieten, **343**, 1911, 96-194. **Stewart, A. M.**—Some notes on melanism, **9**, 1911, 243-245. **Unzicker, R.**—Eine entomologische sammelreise nach Kansas, **346**, 1911, 1-6. **Urich, F. W.**—Miscellaneous notes, **336**, Circ. No. 3, 15-25. **Verson, E.**—Zur kenntnis der drusenzellen (sogenannter innerer secretion), welche in den blutlacunen der insekten vorkommen, **22**,

1911, 295-301. **Wilson E. B.**—The sex chromosomes, **236**, 1911, 249-271.

APTERA & NEUROPTERA. **Buffa, P.**—Studi intorno al ciclo partenogenetico dell' *Heliotrips haemorrhoidalis*, **169**, vii, 71-111. **Morgan, A. H.**—May-flies of Fall Creek (N. Y.), **180**, iv, 93-126 (*). **Tillyard, R. J.**—On some experiments with dragon fly larvae, **128**, 1910, 666-676. **Ussing, H.**—Biologiske og faunistiske iagttagelser over danske slorvinger (Plecoptera), **105**, 1910, 219-226. **Wesenberg-Lund, C.**—Ueber die biologie der *Phryganea grandis* und uber die mechanik ihres gehausebaues, **160**, iv, 65-90.

ORTHOPTERA. **Anon.**—A locustid injurious to man, **313**, ii, 180. **Griffini, A.**—Le specie del genere *Hyperbaenus*, Studio monografico, **169**, vii, 187-203. **Hardy, A. D.**—The stinging of *Grylotalpa coarctata* by *Diamma bicolor*, **277**, 1911, 33-38. **Meek, C. F. U.**—The spermatogenesis of *Stenobothrus viridulus*; with special reference to the heterotropic chromosome as a sex determinant in grasshoppers, **42**, xxxii, 1-21. **Meissner, O.**—Biologische beobachtungen an *Dixippus morosus*, **216**, xxv, 76-79, 81-82, 88-91, 95-96, 101-103, 115-116, 119-120, 125-126, 146-151, 130-131, 137-139, 141-144, 146-151 (Continued). Einige beispiele von der lebenszahigkeit von *Dixippus morosus*, **40**, 1911, 29-30. **Regen, J.**—Regeneration der vorderflugel und des tonapparates bei *Gryllus campestris*, **22**, 1911, 158-159. **Severin & Severin**—The mechanism in the hatching of the walking stick (*Diapheromera ferromorata*), **180**, iv, 187-190. **Shelford, R.**—Descriptions of some n. spp. of Blattidae, **11**, viii, 1-13. Preliminary diagnoses of some n. g. of Blattidae, **8**, 1911, 154-156. **Walker, E. M.**—On the habits and stridulation of *Idionotus brevipes*, and other notes on Orthoptera, **4**, 1911, 303-304.

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TAXONOMY OF FAMILY NAMES.—In the *Annals of the National Museum of Hungary*, volume IX, Dr. Horvath has recently published a paper on the Nomenclature of the Families of the Hemiptera which is of the highest importance, not only to the Hemipterist but to all students of taxonomy. It is the most sane and logical discussion of this subject which has yet appeared and should go far toward offsetting the revolutionary changes made by such extremists as the late Mr. Kirkaldy and his followers. Dr. Horvath takes the stand that we must follow priority in the names of the families as well as in that of the groups of lower value, and in this I believe he is absolutely correct. I have long advocated this in my correspondence and hinted at it in my review of the Kirkaldy Catalogue of the Pentatomidae (*ENTOMOLOGICAL NEWS*, for March, 1910, p. 141), where I say that "the family and tribal names should be formed from the 'type genus,' which I take to mean the genus considered most characteristic by the founder of the family." I can see no reason why a family name so formed should not always be used for the group of genera related to the "type genus" no matter what changes may be made in the limits of such family. It seems to me this is the only way to prevent our whole family nomenclature from falling into inextricable confusion.

In this paper Dr. Horvath gives us a chronological bibliography of each family name in the Hemiptera, throwing out all that are not Latin, and it is encouraging to note that in this order nearly all our old familiar family names will stand. I believe the same conditions would prevail in nearly all orders if this rule is adopted by the next

Zoological Congress in the form in which it was presented by Dr. Horvath to the Congress of 1910.

By Dr. Horvath's plan the following controverted family names in the Hemiptera will stand in the form in which we have long known them: Plataspidae, Cydnidae, Pentatomidae, Pyrrhocoridae, Lygaeidae, Berytidae, Phymatidae, Cimicidae, Anthocoridae, Capsidae, Hebridae, Mononychidae, Jassidae, Cercopidae, Delphacidae, Flatidae, Psyllidae.

In common with most European entomologists, Dr. Horvath has followed Latreille in placing *Salda* Fabr. as a synonym of *Acanthia* Fabr. I claim that Fabricius had the right to limit his own genus *Acanthia* to *Cimex lectularius* Linn, and its allies and to establish his genus *Salda* for the littoral species, and consequently I still use the names *Salda* and *Saldidae* in place of *Acanthia* and *Acanthiidae*, but in all other cases I most heartily endorse Horvath's nomenclature.

The Doctor has made an error in crediting me with being probably the first to use the name Thyreocoridae for Cydnidae. The fact is I have never used this name in that sense but only in place of Corime-lænidæ which I still consider a distinct family, or at least subfamily. If merged with the Cydnidae it must fall as a synonym.—E. P. VAN DUZEE, Buffalo, N. Y.

THE REDUCTION OF DOMESTIC MOSQUITOES.—Instructions for the Use of Municipalities, Town Councils, Health Officers, Sanitary Inspectors and Residents in Warm Climates, by Edward Halford Ross, with illustrations, P. Blakiston's Son & Co., Philadelphia. Price \$1.75 net.

This is a well printed and illustrated work of 114 pages on a timely topic. The "common domestic mosquitoes" treated are *Stegomyia calopus* and *Culex fatigans* but, so far as preventive treatment goes, they serve to illustrate practically all methods.

A general review of the relation of mosquitoes to man in the various parts of the world is given and also the life habits of the "domestic mosquitoes." The literature of the mosquito in relation to disease has grown very extensive but the author of this work has happily selected the material necessary for the practical elucidation of the subject. Many figures and other data are given in regard to the cost of prevention and the saving thereby in annoyance and sickness.

This work will be very useful and valuable to the persons whom it is intended to aid. There is no reason at the present time why people should suffer the terrible annoyance and disease caused by these insects, unless it be in extensive areas like our New Jersey coast, where the present preventive methods make the cost of the necessary work prohibitive.—H. S.

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HENRY C. McCOOK.

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AND

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Henry Christopher McCook.

(Portrait, Plate XV.)

The Reverend Doctor Henry Christopher McCook died at his home in Devon, Pennsylvania, at a quarter past eleven o'clock, of the morning of October 31, 1911.

An editorial in one of the leading Philadelphia newspapers for the morning after his death justly remarks:

"In the death of the Rev. Henry C. McCook, D.D., Pennsylvania loses one of its most distinguished citizens. Doctor McCook was one of the "fighting McCooks" and saw himself service in the Civil War; he was a preacher of power; his long occupancy of one of the chief pastorates in Philadelphia endeared him to thousands and thousands of Philadelphians; he was a fine man, citizen and patriot. As a minister and preacher he occupied a high position, but his fame outside of Philadelphia and of the circles of his own denomination rests on wholly different grounds, and it is likely to be enduring. He was one of the world's eminent scientific observers and investigators. Especially did he achieve distinction in the most interesting phase of that department of natural history—the lives and works of ants and spiders. It frequently happens that a man may write entertainingly of these or similar subjects on a slight basis of

knowledge, and it also frequently happens that a man with deep and accurate knowledge may have no skill in description, narration or exposition. But by a peculiarly happy conjunction of capacities Doctor McCook was profoundly equipped as investigator and also a skilful writer. His works, therefore, are a happy combination of scientific accuracy and of the charm which we usually look for only in romances."

Henry C. McCook was the son of John and Julia Sheldon McCook, and was born in New Lisbon, Ohio, July 3, 1837. His father, a physician, was of Scotch-Irish descent; his mother came from New England. He attended Jefferson College, at Canonsburg, Pennsylvania (now united with Washington College, at Washington, Pa.) receiving an A.B., in 1850. He is said to have been a printer's apprentice, then a student of law, but finally studied at the Western Theological Seminary, at Allegheny, Pennsylvania, until 1861. The Civil War breaking out, he assisted in raising the Forty-first Regiment of Illinois Volunteers, becoming a First Lieutenant and Chaplain therein. After being in charge of Presbyterian churches in Clinton, Ill., and in St. Louis (where he was exposed to much danger from cholera epidemics), he was called to the pastorate of the Tabernacle Presbyterian Church, in Philadelphia, entering his new office in 1870. The church building was then at the southeast corner of Broad street and South Penn Square, where the Betz Building now stands, but the congregation moved to a new edifice, at Thirty-seventh and Chestnut streets, in 1886. At this new location, Dr. McCook continued his ministrations until 1902, when ill-health compelled his resignation. Since then he resided at Brookcamp, Devon, about sixteen miles from Philadelphia, devoting himself to literary work.

Along with his pastoral duties, he found time to act as chaplain to the Second Regiment, National Guard of Pennsylvania, both at home and in Cuba, during the war with Spain, in 1898; to found and to act on the National Relief Commission in the same war; to reorganize a hospital in Havana; to re-arrange and mark the graves of American soldiers in Cuba; to serve as chaplain in other semi-military organizations; to take an

active part in the establishment of the Philadelphia city flag; to participate in political reform and philanthropic movements; to design the seal of the Presbyterian Church in America, and to make researches into the early history of the denomination; to write theological essays like *The Gospel of Nature* and *Ecclesiastical Emblems*, romances as *The Latimers* and *Quaker Ben*, poems, and *The Senator—A Threnody in Verse and Prose* (for Senator Hanna).

From this rapid sketch of his principal activities—and Dr. McCook was first and chiefly a clergyman—it will be realized that his entomological interests were secondary in his life. He devoted himself in this latter field to the habits and taxonomy of spiders and the habits of ants. His studies on spiders appear to have begun about 1873, to judge from expressions in the prefaces to his *American Spiders and their Spinning Work*. Professor Wheeler, in his recent comprehensive volume on Ants, cites twenty-one books and papers on these insects from Dr. McCook's pen between 1876 and 1907, and at least one more title of later date must be added to this list. Dr. McCook's entomological work, therefore, commenced after his settlement in Philadelphia, and his technical papers on both spiders and ants appeared for the most part in the *Proceedings* of the Academy of Natural Sciences and in the *Transactions* of the American Entomological Society. Dr. McCook became a member of the Academy in 1875, and served as one of its two vice-presidents, from May 23, 1882, to December, 1900. The other vice-president, for much of the same period, was the botanist, Thomas Meehan, and among other active scientific members were Leidy, Cope, Horn, Gibbons Hunt, Heilprin, Harrison Allen and Ryder.

Dr. McCook entered the American Entomological Society in 1877; was vice-president from 1884 to 1893, and president from 1898 to 1900. His last appearance at an entomological gathering was probably at the meeting, held in the rooms of the Society and Entomological Section of the Academy, on December 29, 1904, at the occasion of the meeting of the American Association for the Advancement of Science.

That part of his work on the habits of spiders and ants necessitating field observations was done almost wholly in the summers. As he wrote in one of the prefaces quoted above:

"The duties of my calling in a large city have held me rigorously away from the open country except during two months of the year. Summer vacations, and such leisure hours as a most busy life would allow, have been given to the pleasant task of following my little friends of the aranead world into their retreats, and watching at the doors of their fragile domiciles for such secrets of their career as they might happen to uncover. Occasional excursions at other times were unavoidably brief, and often broken off at the point of promised discoveries. I have, in part, indeed, overcome this obstacle by transporting and colonizing specimens, and by directing the observations of others. But, at the best, artificial conditions fall short of Nature's fulness, and no faithfulness of assistants can quite equal personal investigations."

So in August, 1876, he camped on Brush Mountain, near Hollidaysburg, Pennsylvania, to obtain the results recorded in his *Mound-Making Ants of the Alleghenies, their Architecture and Habits* (1877). Three weeks of the summer of 1877, spent near Austin, Texas, furnished much of the material for *The Natural History of the Agricultural Ant of Texas, A Monograph of the Habits, Architecture and Structure of Pogonomyrmex Barbatus* (1879), recording his conclusion that "I do not believe that the ants deliberately sow a crop, as Linneecum asserts. . . . but, finally [he thought] that there is nothing unreasonable, nor beyond the probable capacity of the enumeet intellect, in the supposition that the crop is actually sown" (pp. 38, 39), and for the description of the *Basilica Spider and her Snare* (1878). The vacation of 1879, in the Garden of the Gods, near Manitou, Colorado, ultimately resulted in *The Honey Ants of the Garden of the Gods and the Occident Ants of the American Plains* (1882). Of this work, Professor Wheeler wrote (*l. c.* pp. 367-369).

"The first to publish a trustworthy account of this, or in fact any of our Myrmecocysti, was McCook. He discovered *horti-deorum* in the Garden of the Gods near Manitou, Colorado.....effectively dispelled the notion that the repletes manufacture the honey which they contain..... [made] careful dissections and figures of the gaster of ordinary workers, semirepletes ("semirotunds") and repletes.....

and inferred....that the honey-bearer is simply a worker with an overgrown abdomen..... Although McCook gave excellent reasons for believing that the replete must develop from a worker of the ordinary type, he did not actually witness the transformation."

Dr. McCook's *opus magnus* was his *American Spiders and their Spinning Work. A Natural History of the Orbweaving Spiders of the United States with special regard to their industry and habits*, in three quarto volumes, dated 1889, 1890 and 1893 (1894). The first treats of "Snares and Nests," the second of "Motherhood and Babyhood, Life and Death," the third contains "Biological Notes, Descriptions of Species." The whole is illustrated by 853 text figures and forty colored lithographic plates of 913 figures. The author explained that he "was induced to assume the disagreeable role of publisher by two considerations, the first the wish to be free to present the book according to his own ideas as to typography and illustration, which however, were too luxurious to meet the views of ordinary publishers. In the second place, as a commercial venture, the printing of a scientific work of this sort, with so limited a circulation, gave no prospect for remuneration for cost and care. It is indeed a work of love and must be carried forward chiefly from a desire to enlarge the bounds of truth. Moreover, the cost was too considerable to warrant any Scientific Society to undertake the work of publishing from funds always too limited. The author therefore accepted the burden of cost, together with the yet more uncongenial details of selling, as a part of his task."

The edition was limited to 250 copies and the author had received subscriptions for about 140 of these at the time of publication of the second volume.

Of this work, Professor Thomas H. Montgomery, Jr., writes:

Dr. McCook's studies on spiders, brought together in the three large and beautifully illustrated quarto volumes of his work, 'American Spiders and their Spinning Work,' represent the most comprehensive accounts of the habits of spiders since the times of Blackwall and Menge. These contain a wealth of new observations particularly on the architecture of snares and nests, as well as a full taxonomic treatment, accompanied by colored plates, of the American Epeiridæ. This work is a classic of arachnological literature, and has been a powerful stimulus to other naturalists."

His later entomological publications were chiefly of a popular nature. Such were *Tenants of an Old Farm; leaves from the note book of a naturalist* (1885); *Old Farm Fairies. A Summer Campaign in Brownieland against King Cob-weaver's pixies, A Story for Young People* (1895); *Nature's Craftsmen, Popular Studies of Ants and Other Insects* (1907); and *Ant Communities and How They are Governed, A Study in Natural Civics* (1909), in which the social activities of ants and of men are compared.

Washington and Jefferson College, his alma mater, gave him its LL.D.; Lafayette College made him D.D., and honorary Sc.D., and he was an honorary member of the British Association for the Advancement of Science.

Dr. McCook married in 1861, Emma C. Herter, who died in 1897. Two children, Mrs. William Slade Clark and Captain Paul McCook, of the United States Army, survive their parents. In 1899, Dr. McCook married Mrs. E. D. S. Abbey.—P. P. C.

A new *Papilio* from Florida, and one from Mexico (Lepid.).

By W. SCHAUS, London, England.

Papilio ponceana sp. n.

♂, Palpi black ringed with ochreous before tip. Head, collar, and thorax black brown, with lateral yellow lines on frons continuing across vertex, collar, and along patagia dorsally. Abdomen dorsally black, laterally and underneath yellow.

Wings black brown, markings yellow. Fore wings: a narrow yellow fascia from close beyond cell and vein 5 to middle of inner margin; a spot above 5 more outset, and a large elongated spot above it containing a fuscous brown spot anteriorly; lunular spots above and below vein 8, oblique towards apex; a spot close to cell above 7, surmounted by short costal streaks; subterminal small semilunular spots, very small above 6, and in a nearly straight line; terminal spots between the veins.

Hind wings: the medial fascia broader, irrorated with brown on inner margin; large subterminal spots, the one on costa inset; the spot between 4 and 5 projecting inwardly, those between 2 and 4 deeply

lunular; the spot on inner margin elongated, shaded with rust brown, heavily towards base, partly divided by a transverse black spot, and surmounted by some bluish scales; terminal interspaces and margin of tail yellow; the tail straight and of even width.

Fore wings below yellowish; fuscous streaks in cell; a black shade at end of cell and along median, and on basal half of submedian; a broad postmedial black space from the much broader medial fascia to subterminal spots, its outer edge lunular; this black space is irrorated with yellow above vein 4, and from 6 to 8 forms two narrow lunules merely edged with black; termen narrowly black, with yellow spots.

Hind wings below yellow, showing the dark surface of upper side; a large black lunule at end of cell; an irregular brown postmedial space widest between 3 and 4, and almost obsolete on costa, cut by the yellow veins, and followed by light blue irrorations, narrowest between 4 and 5, widest between 2 and 3, separated from the brown space by an irregular black line, and followed on inner margin and between 2 and 3 by a black shade, and a black lunule at anal angle; a broad marginal lunular black line; some yellow irrorations along vein 4 on tail. Expanse 78 mm.

Female browner; the subterminal spots on fore wings lunular, those on hind wings between veins 2 and 5 more deeply lunular. Hind wings below more ochreous yellow, especially on outer margin. Expanse 85 mm.

Hab., Miami, Florida.

Allied to *P. aristodemus* from Haiti, and *P. temenes* Godt. from Cuba, differing in the much narrower medial fascia, the straighter row of subterminal spots, and in the markings underneath. Types in U. S. Nat. Mus.

Papilio lopiua sp. n.

♂, similar to *P. alopis* G. & S., the tails however straight as in *P. montezuma*, not spatulate; the spots on hind wings close together, those between 6 and 7 almost suffusing; the inner row of spots larger than in *alopis*, and whiter. Underneath the single costal spot is white, not red; the inner spots between 5 and 7 are large, lunular, and suffuse with the outer spots. Expanse 82 mm.

Hab., Guadalajara, Mexico.

This may possibly be a hybrid between *alopis* and *montezuma*. Type in U. S. Nat. Mus., Washington, D. C.

Both species were collected by the writer.

A new Genus and four new Species of Aphididae (Rhynch.).

By C. P. GILLETTE, Colorado State Agricultural College,
Fort Collins, Colo.

(Plate XVI.)

ATARSOS n. gen.

Lice in all stages without tarsi; a small pulvillus-like pad on the distal end of each tibia; moderately hairy, the hairs being capitate in all stages; cornicles short, tapering; antennæ in all adults much shorter than the body and with numerous sensoria on joints 3, 4 and 5, and with spur little longer than the joint bearing it.

Type: *Atarsos grindeliae*, n. sp.

Through the kindness of Mr. J. T. Monell, I have been able to examine mounted specimens, alate and pupæ, of *Mastopoda pteridis* Oest. Striking characters are the 6-jointed antenna with the very long third and short fifth joints, the very long filament, the long cornicles convex on the free end without flange, and the vestigial tarsi on all legs.

Atarsos grindeliae n. sp. (Plate XVI, Figs. 1-6.)

Described from specimens taken on leaves of *Grindelia squarrosa*, at Fort Collins, Colo., May 23, 1911.

Alate Viviparous Female.—Color of abdomen dull or dusky green; head, thorax above and below, distal ends of femora, tibiae and antennæ black or blackish; eyes very dark red; on the dorsum are numerous broken transverse dusky dashes, and lateral spots. Length of body 1.60 to 2 mm.; antenna 1.10 mm.; joint 3 about equaling joints 4, 5 and 6 together (occasionally joints 3 and 4 are connate); joints 3, 4 and 5 with tuberculate sensoria about as follows: III, .40; IV, .18; V, .13; VI, .09; spur, .13 mm; terminal joints very scabrous; venation normal, the veins rather heavy and dusky; cornicles stout, cylindrical, sharply constricted close to the rather broad flange, .15 mm. in length; cauda short, broad at base and tapering to a moderately acute apex; all tibiae ending in a light pad, depressed at the center and protruding on the ventral surface and entirely without tarsi; hairs on all parts, except the cauda, capitate.

Apterous Viviparous Female.—Pale shining green in color, with antennae, at least in distal half, distal ends of tibiae and cornicles dusky to blackish; eyes red; cornicles distinctly stouter at base than

at tip; antennae about the same as in the alate form; numerous sensoria on joints 3, 4 and 5; joints 3 and 4 often coalesced on one or both sides.

The most striking peculiarity of this louse is the entire absence of tarsi in all stages. There seems to be no modification of form too difficult for nature to bring about if it is needed and if sufficient time be given. This louse is undoubtedly better able to travel over the sticky surface of the *Grindelia* leaves without tarsi than with them. Yet two other species of lice having well developed tarsi get along well enough on the same plant.

On June 17 and 18 at Fort Collins the lice were common among the young, tender leaves of the host plant, but no alate lice or pupæ could be found. The alate lice were migrating freely two weeks ago. A rather common species from Fort Collins to Denver at least, and taken many times by both Mr. L. C. Bragg and the writer.

***Brachycolus tritici* n. sp.** (Plate XVI, Figs. 7-9.)

Alate Viviparous Female.—Specimens taken from leaves of Colorado blue-stem, *Agropyron glaucum*, at Fort Collins, Colo., May 24, 1911, by L. C. Bragg.

Head, thorax above and below, antenna, except basal portion of 3rd joint, eyes, tarsi, distal ends of tibiae, and the greater portion of the distal ends of the femora, cauda and anal plate black, and powdered with white. Wing veins also conspicuously black, stigma blackish and rather narrow and stigmal vein nearly straight; cubital twice forked; abdomen light green, the color of the leaves of the grass and lightly powdered with white; cauda stout, broad in basal portion, pointed, and more or less dusky; cornicles a little yellowish or brownish and slightly raised above the surface, not as long as broad; vertex broad and but little convex; no antennal tubercles; length of body 1.30 to 1.50 mm.; antenna .70 to .80 mm.; joints 4, 5 and 6 about equal; spur a little longer than joint 4; joint 3 a little shorter than joints 4 and 5 together. There is an irregular row of about 8 sensoria on distal two-thirds of joint 3 and about 2 sensoria on joint 4; length of wing, 2.30 mm.

Apterous Viviparous Female.—Body long and narrow, nearly parallel-sided, and rather densely covered with a fine white powder; length about 1.88 mm.; width .60 mm. The general color is pale greenish to

pale yellowish; the head, distal one-half of antenna, most of the rostrum, the anal plates, cauda and legs, especially the tarsi, dusky; eyes black. In most specimens an impressed line just inside the lateral margin extends nearly the full length of the thorax and abdomen. The legs are very short, the hind femora measuring about .34 mm.; the hind tibiae .43 mm.; length of antenna .59 mm.; joint III slightly the longest; joints IV, V and VI sub-equal; beak just surpassing the second coxae; cauda rather broad and flat, pointed, a little longer than the width at the base; length .10 mm.; cornicles very small, tuberculate, located upon joint 6; in color like the body or a little dusky.

Described from specimens taken on wheat at Fort Collins, October 10, 1908. Winged specimens have also been taken early in June and in July.

Apterous Oviparous Female.—Apparently the apterous oviparous females are exactly like the viviparous form. At least they are so nearly alike that I do not notice any marked difference in characters.

Apterous Male.—A few males were present in the colony studied. They are more yellow in color with less powder upon their bodies. The antenna is entirely black or blackish, and the other parts that are dusky in the females are dark in color in the males. Length about 1.10 mm.; width .40 mm.; length of antenna and the various joints as in the viviparous female above, or slightly shorter; the rostrum attaining the third coxae; hind femora, including trochanter .29 mm.; tibiae .40 mm. I have not been able to distinguish any sensoria upon the antenna except the cluster at the distal end of joint 6.

This is seemingly a rather rare species occurring upon grasses, and has been taken several times by L. C. Bragg upon the leaves of blue-stem, *Agropyron glaucum*, and upon wheat during the summer months in the vicinity of Fort Collins.

Chaitophorus agropyronensis n. sp. (Plate XVI, Figs. 10-12.)

This louse differs so much in general appearance from typical *Chaitophorus* species that it scarcely seems right to place it here, but I dislike to establish a new genus for it.

Alate Viviparous Female.—General color of abdomen, green; the black or blackish parts are head, thorax above and below, antenna (except basal portion of joint 3), tarsi, distal ends of tibiae, entire femora, cornicles, a spot on each lateral margin of the abdominal segments, a rather broad but much interrupted band on the abdominal segments after the first, and narrow transverse dashes between the segments, and the knobbed cauda. The wing veins and the stigma are

also black or blackish. The body is everywhere set with stout gray hairs much as in the apterous form, and is also everywhere covered with a white pulverulence. The cornicles are conical, the length being less than the basal diameter; wing venation normal, the cubital usually with two forks but the second fork sometimes lacking; the cubital cell shallow, the vein being somewhat recurved; legs short and stout; length of body 1.65 to 1.90 mm.; wing 2.50 mm.; antenna .65 mm.; hind tibiae .60 mm.; tarsi unusually long, measuring .20 mm.; joints 3 and 4 of antenna coalesced into one with no indication of the union in most examples before me, and equal in length to joints 5 and 6 and the spur combined, the spur being a trifle shorter than the joint which bears it, and this joint is fully as long, or a trifle longer than the joint preceding it; hairs of body short and stout with acute points. Cauda short with knob broad and not narrowly constricted at base; the long third joint of the antenna with 4 to 5 small circular or oval sensoria. The pupa is greenish yellow, set with gray hairs, and has very black wing pads; black markings of abdomen very similar to the alate form; a pair of very conspicuous black patches on mesothorax.

Described from specimens taken on *Agropyron glaucum* at Fort Collins, Colo., May 30, 1911. Fairly common.

Apterous Viviparous Female.—A rather long narrow bodied louse, of a rather uniform rusty yellow color when fully mature but with a distinct darker brown, somewhat broken stripe extending longitudinally the whole length of the body on either side of the median line; eyes dark red; legs and antenna dusky yellow, the latter with the terminal joints blackened; number of joints 5; joints 4 and 5 and the spur sub-equal. Antenna less than one-third the length of the body; legs short and rather weak; cornicles raised but little above the surface, broader at base than they are long; cauda knobbed; the entire surface of body set with short, stout gray hairs.

A letter from Mr. E. O. G. Kelly, dated Wellington, Kansas, October 6, 1908, states that he has taken this louse in several places throughout the Northwest, both last year and the present summer.

Agropyron glaucum is the only food plant upon which we have taken this louse. The colonies rest upon the upper surface of the harsh leaves of this grass and are usually accompanied by small ants.

Chaitophorus artemisiae n. sp. (Plate XVI, Figs. 13-16.)

Alate Viviparous Female.—Abdomen cinnamon brown, head and thorax brownish black; tibiae and basal portion of third joint of

antenna pale yellowish; tips of tibiae and tarsi very black; veins and stigma of wings dusky; cornicles short and stout and broadest at base, where the diameter just about equals the length. Length of body 1.40 to 1.50 mm.; wing 2.25 mm.; antenna 1.70 mm.; hind tibiae .85 mm. Joints of antenna: III .40; IV .29; V .27; VI .11; filament .58 mm.; sensoria about 4, on joint 3.

Described from specimens taken at Boulder, Colo., June 1, 1911, by L. C. Bragg.

I have taken the alate lice at Fort Collins as early as May 25.

Apterous Viviparous Female.—General body color almost uniform brownish black, highly polished throughout; antenna black in distal portion to the middle of the third joint; legs black except the proximal one-half of the tibiae which is yellowish in color; cornicles colored like the body, tuberculate, not longer than broad, cylindrical, without flange; prothorax with stout, blunt tubercles; body, legs and antennae with a few weak hairs; antennae not upon distinct tubercles; vertex moderately convex; cauda small, broader than long; antennal joints about as follows: III .34; IV .26; V .23; VI .13; VII .53 mm.; length of body 1.70 to 2 mm.; antenna 1.40 mm.; sensoria 1 or 2, on joint 3. Figure 13 is of a stem ♀.

Apterous ♂ ♂ and oviparous ♀ ♀ were seen in September upon the same host plant but have not been described.

While this louse does not seem to be very common, it frequently becomes very abundant upon individual plants of *Artemisia dracunculoides*.

The younger larvae are decidedly green in color.

EXPLANATION OF PLATE XVI.

Atarsos grindeliae: 1, alate agamic female; 2, apterous form of same; 3, antenna; 4, cornicle; 5, footless tibia of alate form; 6, antenna of apterous form.

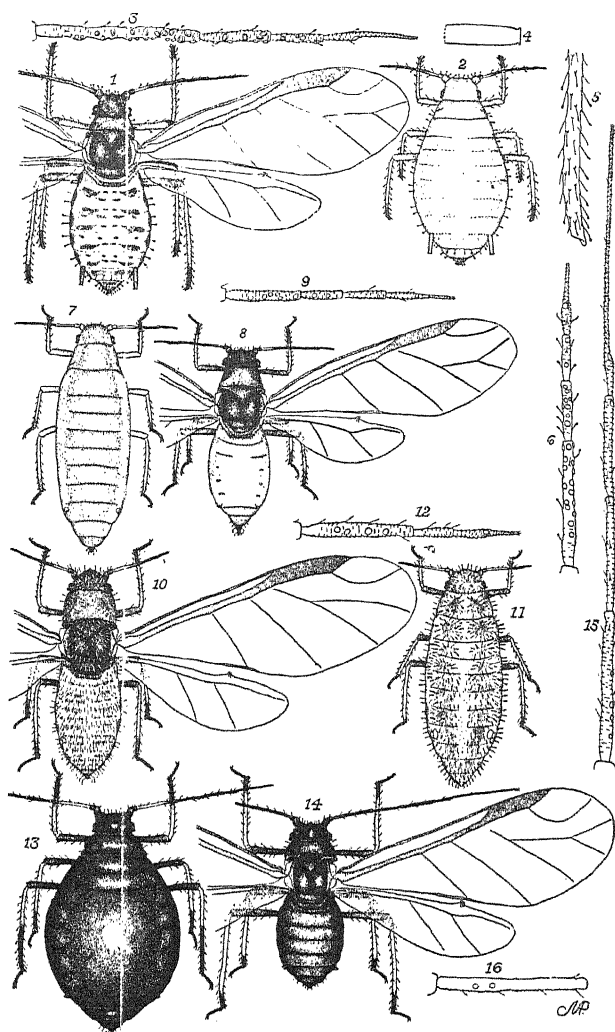
Brachycolus tritici: 7, apterous, and 8, alate viviparae; 9, antenna of alate form.

Chaitophorus agropyronensis: 10, alate and 11, apterous viviparae; 12, antenna of alate form.

Chaitophorus artemisiae: 13, stem-mother; 14, alate agamic form; 15, antenna of alate form; and 16, third joint of antenna of apterous summer form of same louse, but in most examples there is but one sensorium.

All the figures of lice are enlarged 15 times; figures of antennae and other small parts, 52 times.

Drawings by Miss M. A. Palmer.



NEW APHIDIDAE—GILLETTE.

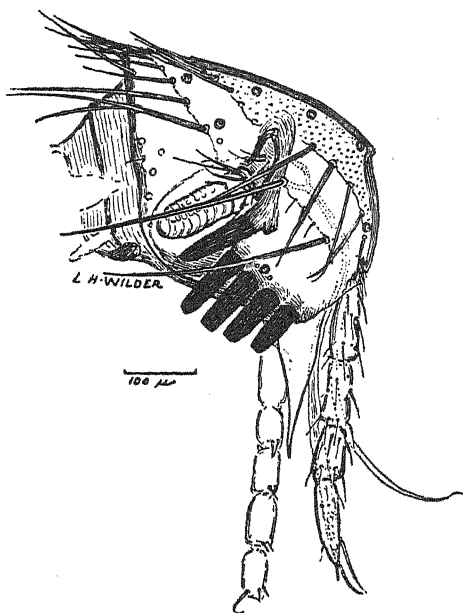
**A New Flea, *Ctenophthalmus Heiseri* spec. nov.
(Siphonaptera).**

By GEORGE W. MCCOY,

Passed Assistant Surgeon, U. S. Public Health and Marine
Hospital Service, San Francisco, California.

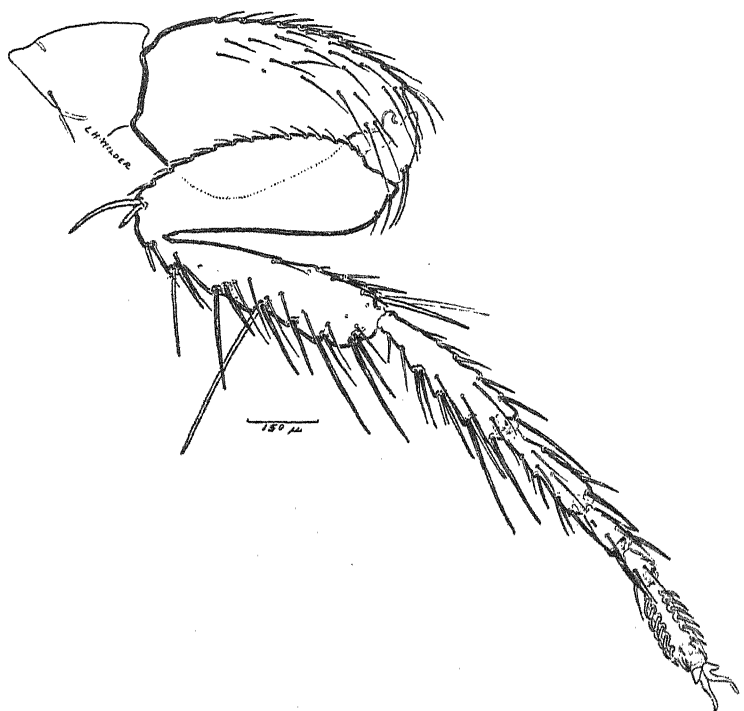
Ctenophthalmus heiseri sp. n.

Female. Head.—Occiput is very gently rounded, and forms with the front of the head a distinct angle at which the occiput slightly overlaps the anterior margin. A row of five large bristles is found extending from just in front of and below the upper extremity of the antennal groove to the insertion of the maxillary palpi. Two



or three bristles are found about one-third of the distance from the posterior margin of the occiput; the upper near the midline, the lower further forward and about midway to the upper end of the antennal groove. Posterior to these is a row of about five bristles extending slightly forward; the lower being about midway between the upper extremity of the antennal groove, and the posterior border of the occiput. The posterior inferior curved margin

of the gena carries a row of five stout spines. The origin of the upper one is apparently overlapped by a chitinous projection. The three succeeding ones are of about the same length. The lowest one is somewhat shorter than the others. Near the middle of the front margin of the gena is a very large bristle. The antennal groove is about five-sixths of the depth of the head, and is not connected with the opposite antennal groove by a furrow extending across the head. Labial palpus extends beyond three-fourths the length of the an-



terior coxa. The maxillary palpus is about as long as the first four joints of the labial palpus. The first joint of the maxillary palpus is longer than any of the succeeding joints. The eye is wanting.

Thorax.—Pronotum carries a row of about ten bristles just posterior to the middle, and on the posterior margin a row of twenty stout spines. The mesonotum bears two rows of very fine hairs near the anterior margin; back of these there is a row of stouter hairs, and still further back a row of about twelve heavy bristles. The metanotum is similarly clothed except that the two rows of

fine hairs are wanting. The epimerum and the episternum of the mesonotum are joined by a strongly marked suture. The epimerum bears one hair, the episternum none. The episternum of the metanotum carries one hair near the posterior superior angle, and a very large bristle just below this.

Abdominal segments.—The first tergite bears from before backwards an irregular row of hairs, a row of about 12 long bristles, a row of shorter bristles, and six stout pegs or teeth between which are long bristles. The second tergite carries about eight teeth between which are small hairs, and behind these a row of bristles. The third carries an anterior irregular row of hairs, then a row of bristles and behind these a row of six teeth. The fourth has bristles like the third, and four stout teeth. The fifth has similar hairs and bristles, and two stout teeth near the midline. The sixth has about six long hairs on each side. The seventh carries two antipygidial bristles on each side. The second, third and fourth tergites have two bristles below the stigma; the fifth and sixth have one. The sternites each carry a row of long bristles.

Modified segments.—The eighth tergite is quite hairy. The style is cylindrical and carries a long hair at the point.

Legs.—The hind coxae have several irregular rows of short, stout bristles on the inner side below and toward the anterior margin. Hind femur has three or four hairs on inner side. The last hind tarsal joint has six spines on either margin, the last being a little shorter than the preceding ones. Between the two distal spines are two rather small spines.

Relative lengths of hind tarsal joints, 22, 14, 8, 5, 9.

Relative lengths of middle tarsal joints, 11, 8, 6, 4, 10.

Length—2.4 mm.

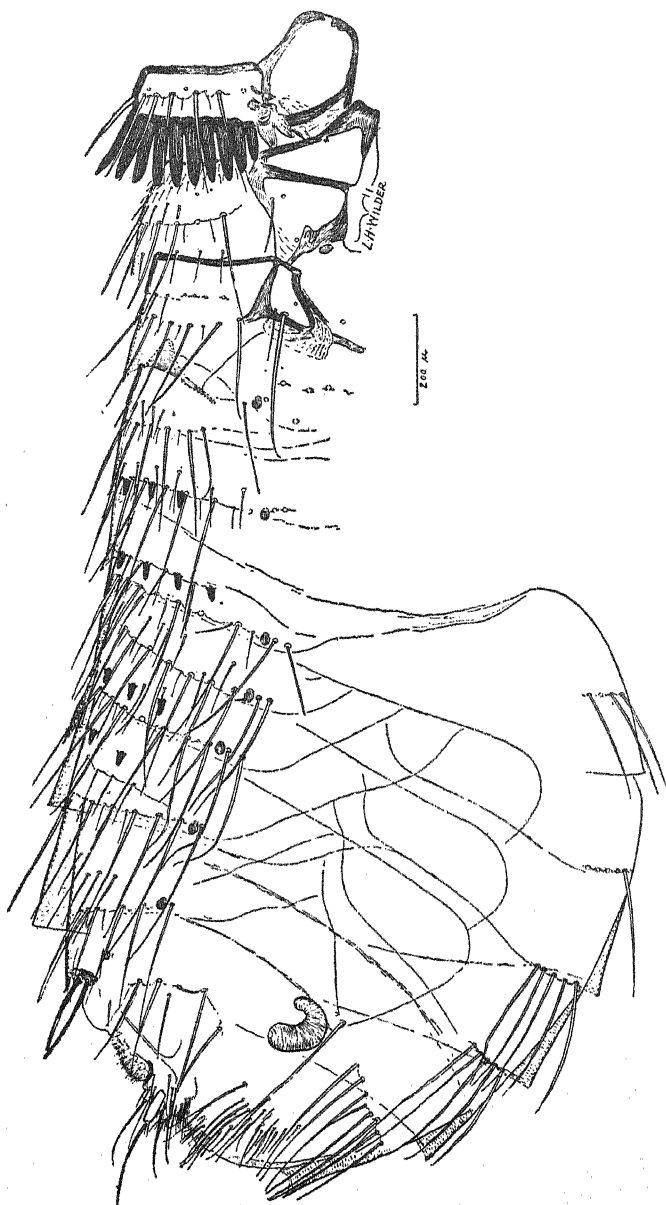
Color, dark brown.

Type specimen in the collection at the U. S. National Museum, Catalogue No. 14,154. Host unknown. Locality, Mojave, California.

The specimen was sent to the Honorable N. Charles Rothschild, who kindly examined it and pronounced it a new species of *Ctenophthalmus*.

Judged by the description of *C. fraternus*, Baker (1), the flea described here stands nearer to it than to any other American species.

1. Proceedings of the United States National Museum, Vol. 27, 1904, page 423.



Ctenophthalmus heiseri sp. n., page 445.

Studies on Costa Rican Odonata.

III. Structure and Transformation of the Larva of *Mecistogaster modestus*.

By PHILIP P. CALVERT, PH.D., University of Pennsylvania,
Philadelphia, Pa.

(Plates XVII-XIX)

The early stages of this long-bodied dragon fly whose discovery and habits have been described in the News for November, pages 402-410, furnish the following

DESCRIPTION OF THE LARVA OF *M. MODESTUS*.

Material Studied:

(a) From Juan Vifias, Costa Rica.

No.		Total length including caudal gills.	Body length excluding caudal gills.
48	♀ larva	(gills lacking)	11 mm.
49	♀ "	15 mm.	11.5 "
54	♀ "	10.5 "	7 "
55	♂ exuvia	(gills lacking)	21.5 "
56	♂ partly transformed		
57	♀ exuvia	25 mm.	19.5 "
58	♀ larva	23 "	19 "
58	♀ exuvia	(gills lacking)	
59	♀ exuvia	" "	19.5 "
61	♂ exuvia of March 13-16....	" "	(in fragments)
1	♂ larva	25.5 "	21 mm.
2	♀ "	24 "	20 "
3	♀ "	17.5 "	14 "
	♀ exuvia of April 28.....	(gills imperfect)	(distorted)
	♀ " " May 1.....	23.5 mm.	19.5 mm.
	♂ " " Dec. 17.....	(gills lacking)	(distorted)
101	? larva recovered from crop of No. 1		(in fragments)

(b) From Orosi, Costa Rica, March, 1911, collected by Sr. C. Picado T., and forwarded by Prof. J. F. Tristan.

♀ exuvia dimensions as above, 20.5 and 18 mm.

♂ exuvia dimensions as above, 23 and 19.5 mm.

(c) From Cordoba, Mexico, April, 1908, bred by Mr. F. Knab.
(See Calvert, 1910.)

♀ exuvia (distorted).

Mature larva.

Description based on larvæ Nos. 1, 2 and 58, and exuvæ of 55, 57, 59, April 28, May 1, Orosi (2) and Cordoba.

Color, pale yellowish- to reddish-brown, according to the length of time which has elapsed since moulting, posterior ends of abdominal segments darker.

Head concave in the middle posteriorly for the reception of the prothorax, angles of the hind margin rounded off and clothed with short hairs and short spines. Compound eyes distinct. Ocelli indicated by three pale yellow spots.

Antennæ 7-jointed, ratios of the lengths of the joints in an antenna detached from larva No. 1 and in alcohol under a cover-glass: 18, 20, 33, 26, 19, 12, 7; joints 1 to 7 successively decreasing in thickness (Pl. XVII, Fig. 3), the distal ends of joints 3-6 a little thicker than the proximal ends; naked, except for a whorl of long and very delicate hairs on the middle of the 2nd and 7th joints and near the distal ends of the 4th, 5th, 6th, and, in some, also the 3rd, joint; in dry exuvæ, *e. g.* after metamorphosis, these hairs are often matted down on the antennæ and not visible except under a compound microscope.

Ventral surface of each gena with a row of about twenty short spines parallel to the posterior margin of the compound eye, the spines directed forward.

Mandibles one-branched, apex of left mandible with five teeth, first (counting from the dorsal margin) and third shorter than the other three, ventralmost longest; apex of right mandible with four teeth more nearly equal in size, ventralmost longest.

Maxillæ very similar to those of the larva of *Cora* described and figured* in the first study of this series, except that the attenuate tip of the inner lobe bears *two*, instead of three teeth.

Labium, when at rest, reaching almost or entirely to the hind edge of the prothorax; mentum about twice as wide at the level of the articulations of the lateral lobes as at its proximal end (Pl. XVII, Fig. 6), strongly produced distad to form the median labial lobe which lacks the slightest trace of a median cleft, but bears 32-41 crenulations on each side of the median line (Pl. XVII, Fig. 2), usually a short blunt spine in the excision between each crenulation and the next; three or four pairs of setae near the middle and other shorter setae situated more proximad and more laterad, and a number of very short pointed spines near the crenulated distal margin, on the dorsal mental surface; each lateral mental margin in the distal half with 14-21 short conical articulated spines, which series is continued mesad by about 4 similar spines on a thickening near the articulation of mentum and lateral labial lobe; on the ventral mental surface are two pairs of moderately long setae, one pair proximal to, the other pair distal to, the level of articulation of the lateral labial lobes, and many small

*Ent. News, XXII, p. 53, pl. III, Figs. 29, 31.

setae. Lateral labial lobes (Pl. XVII, Fig. 5) with a long tapering terminal articulated spine and two tapering distal teeth, the inner (mesial or ventral) of which is the longer, 6-7 setae between the terminal spine and the base, and a group of 4-6 (8-9 Cordoba) short conical spines on the lateral margin opposite the most proximal seta.

Thorax without well-developed tubercles or other peculiar structures. Mesostigmata latero-dorsal, between prothorax and mesothorax, elongated transversely. Metastigmata smaller, lateral, close to the anterior margin of the somite. In the alcoholic larvæ, the front wing-pads reach to slightly posterior to the middle of abdominal segment 4 (Nos. 1 and 2), or to the anterior edge of 5 (No. 58), the hind wing-pads to the hind end of segment 4 (Nos. 1 and 2) or to the middle of 5 (No. 58). In the (metamorphic) exuviae, the point reached by the front wing-pads varies from the anterior edge of 4 to one-fourth the length of 4, and that reached by the hind wing-pads from one-third to one-half the length of 4. These differences between the larvæ and the exuviae are probably due to the distortion produced by the process of exuviation.

Legs slender, with very short hairs on the longitudinal carinae, tarsi three-jointed with two untoothed claws which are curved and very sharp at the apex (Pl. XVII, Fig. 1), no empodium; on the distal part of the tibiae and on each lateral margin of the plantar surface of the tarsal joints are one or more rows of strong, trifid (or less frequently quadrifid or pinnate) spines (Pl. XVII, Fig. 4), whose length ranges from .07 mm. to .15 mm.

Abdomen subcylindrical, of ten complete segments, decreasing gradually in width and in height from 1 to 10, without dorsal or lateral hooks, covered with minute hairs .1 mm. long. Viewed ventrally, the lateral margins of each of segments 1-7 widen caudad from the anterior end to two-thirds or three-fourths of the segment's length and thence narrow to the posterior end. Hind dorsal margin of 10 in the middle shallowly concave and produced upward (dorsad).

Rudiments of accessory male genitalia visible under the chitin on the ventral side of abdominal segment 2. Male gonapophyses represented by two strong sharply-pointed spines on the ventral side of 9, situated at three-fourths of the segments' length, about half as long as 9 and projecting ventrad and caudad to the level of the middle of 10.

Female gonapophyses: ovipositor, in the alcoholic larvæ, reaching to the middle (No. 2), or to seven-eighths (No. 58) of abdominal segment 10, in the exuviae to seven-eighths of 10, or to beyond this segment for a distance equal to about one-eighth of the length of 10; the sharply-pointed genital valves reach to the middle of 10 (No. 2), or to barely beyond 10 (No. 58), or in the exuviae to beyond 10 for as much as one-third of the length of 10.

Rudiments of the superior appendages or 'cercoids' of the imago viewed dorsally half as long, or less than half as long, as 10, digitate, bent more or less ventrad near the middle of their length in the male, nearly straight in the female, pale brownish-yellow. (Pl. XVII, Fig. 8, *sa*).

The three caudal gills much darker in color than the abdomen, lozenge-shaped or diamond-shaped in transverse section of the anterior portion or stalk (which comprises one-half to three-fifths of the total length of the gill), the vertical diameter greater than the horizontal, the four angles distinctly keeled or carinate, the carinae minutely serrate (less marked on the lateral carinae of the median gill and on the mesial carina of each lateral gill), each serration bearing a short hair; on the two lateral gills the dorsal serrations are larger and fewer than the ventral serrations, while on the median gill the dorsal serrations are smaller and more numerous than the serrations of the ventral edge. The height of each gill (*i. e.*, its vertical diameter) increases gradually from the base caudad to one-half or three-fifths of the total length and then expands more abruptly into the thinner, foliaceous, terminal portion (Pl. XVII Figs. 12, 13, Pl. XVIII, Fig. 10), which may taper rather rapidly to an acute apex or may end as a fully rounded convexity. The lateral carinae of the anterior stalk of the gill are not continued on to the terminal foliaceous portion, but the dorsal and ventral carinae are continuous with the non-serrated but sparsely hairy dorsal and ventral edges of the foliaceous part. The maximum height of the foliaceous part is about twice the maximum height of the stalk. The caudal gills are held in life so that the foliaceous part is vertical (Pl. XVIII, Fig. 11).

The following viscera are described from larva No. 1, the only one which has been dissected as yet.

The fore-gut reaches to the middle of the third abdominal segment, the mid-gut to the anterior end of the seventh abdominal segment (Pl. XVII, Fig. 8). The distinct gizzard is armed with eight larger and eight smaller longitudinal chitinous folds, all bearing teeth (Pl. XVII, Fig. 9), whose formula may be written $8 \left(F \frac{5'' \pm}{6' \cdot 10'}, f \frac{2''-3''}{2'} \right)$ (cf. Higgins, 1901, pages 132, 133, 136.)

The rectum opened longitudinally and spread flat has three wider cellular (glandular?) longitudinal areas, one of which is mid-dorsal, the other two right-ventral and left-ventral respectively, separated by narrower, non-cellular, longitudinal bands (Pl. XVII, Fig. 10). The nuclei of the cellular areas can be seen in the unstained rectum, but become much more distinct after staining (alum carmine was employed). Each of these three cellular areas is supplied with a branching trachea which for the ventral areas is a derivative, direct or indirect, of the lateral trachea of the same side of the body (Pl. XVII,

Fig. 7); the origin of the mid-dorsal rectal trachea was not determined. The three non-cellular longitudinal bands of the rectum had, when the viscus was first opened, the shiny, silvery appearance which suggests enclosed air, but no tracheæ could be followed into these bands. The chitinous lining of these bands was much wrinkled into short folds.

The crop of this larva (No. 1) contained fragments of a smaller larva of the same species which belong undoubtedly to the small larva referred to on page 407 as having been collected at the same time; these fragments were identifiable as follows: A large part of the head, most of the mentum with left labial lobe and much of the right labial lobe still attached, groups of two or more abdominal segments, and two of the caudal gills. The crop also contained a mosquito larva 4.2 mm. long, comprising head, thorax and abdomen all in one piece; and most of the body of a copepod measuring .3 mm. long. The size of these fragments is such as to excite wonder that they were not more minutely subdivided by the mouth-parts, unless indeed their size is due to unusual 'bolting' by the larva under the stimulation of capture. Behind the gizzard the contents of the alimentary canal were much smaller particles and if the food fragments in the crop were not abnormally large, there is here more evidence of a subdividing function in the gizzard than I was able to adduce on another occasion (Calvert, 1899, p. 416).

The arrangement of the principal tracheæ is indicated in Pl. XVII, Figs. 7, 8. It does not differ in any important features from that shown in a large-scale (unpublished) drawing which I made many years ago from a living larva, 2 mm. long, of the European *Agrion puella*. The chief tracheæ of two caudal gills have also been figured (Pl. XVII, Figs. 12, 13) from the preserved material. Unfortunately, no study of the finer tracheoles was made from life, when alone they can be distinctly traced.

The ventral nerve cord consists of suboesophageal, pro-, meso-, and metathoracic pairs of ganglia (these last three in their respective somites and very distinct from each other), and seven pairs of abdominal ganglia as follows: the first in the middle of segment 1, the second near the hind end of 2, the third at the articulation of 3 and 4, the fourth to the seventh in the extreme anterior ends of 5, 6, 7 and 8 respectively.

Developmental Changes in the Larva.

Comparison of larvae Nos. 48, 49, 54, 3 and that (No. 101) recovered from the crop of No. 1 and the exuviae of 58 and 61 listed on page 449, have furnished only the following differences from the above description of the mature larva:

	Larva No. 101	Larva No. 54	Larva No. 48	Larva No. 49	Larva No. 3	Exuvia of No. 61	Exuvia of No. 58	Larva No. 58 (for com- parison)
Total length in mm. incl. caudal gills.....	?	10.5	?	15	17.5	?	?	23
Body length in mm. excl. caudal gills.....	?	7	11	11.5	14	?	?	19
Width of labium in mm. at level of articulation of lateral lobes....	1.3	1.8	2.15	*	2.09	3	3.15	3.67
Number of crenulations on one-half of distal margin of mentum....	21	26, 27	29, 31	28 ? 28	31.28	34	36, 40	37, 41
Number of lateral spines on distal half of mentum .....	.....	10	11, 13	*	*	15, 16	15	16
Mesostigmata .....	.....	not visible	visible, but slightly dev'd.	not visible	present	present	present	present
Metastigmata .....	.....	{ Future site marked } by a darker point			present	present	present	present
Front wing-pads reach to .....	.....	two-thirds of hind edge of metathorax	abd. seg. 1	abd. seg. 1	ant. margin of abd. seg. 1	*	ant. margin of 2	ant. margin of 5
Hind wing-pads reach to .....	.....	hind edge of abd. seg. 1	one-half of abd. seg. 2	two thirds of abd. seg. 2	ant. edge of abd. seg. 2	*	middle of 2	middle of 5
Points reached by ♀ gonapophy- ses, viz.: { fore pair..... { median pair..... { Ovipositor.....	.....	one-eighth of 9	two-fifths of 9	hind edge of 9	three-fifths of 9	(♂)	one-fourth of 9	seven- eighths of 10
genital valves (hind pair).....	.....	three-fourths of 9	hind edge of 9	hind edge of 9	hind end of 9	(♂)	one-fourth of 9	seven- eighths of 10
Cercoids .....	.....	one-third of 10	one-half of 10	middle of 10	slightly be- yond hind end of 9	(♂)	middle of 9	barely beyond 10
Caudal gills.....	foliaceous terminal part narrower (pl. xviii. f. 11)	foliaceous terminal part wider (pl. xviii. f. 12)	.....	one-fifth as long as 10	.....	.....	one-fourth as long as 10 lost	one-half as long as 10

* Not determined.

In this table the forms compared have been arranged in order according to size from the smallest to the largest. The increase in total length and in body length is accompanied with increases in the number of crenulations and of spines of the mentum and in the lengths of wing-pads and of female gonapophyses except in larva No. 3. Miss Butler (1904) has found an increase in the number of distal mental crenulations to take place with increasing age in the larva of *Lestes uncatus*, while a lack of constant correlation between increased size and increased length of wing-pads has been noted by Balfour-Browne (1909, p. 278) and Backhoff (1910, p. 654) for larvae of several species of European Agrionines.

A comparison of the last two columns of the table is interesting as showing the amount of change which can take place within ten days after a moult.

General Features of the Larva.

In spite of their unusual habitat, the larvae of *M. modestus* show very few differences from the general Agrionine type of larva, the stalked caudal gills of the later stages being one of these. As in most, perhaps all, Zygopterous larvae, the caudal gills may be lost without interfering with growth, development and transformation (Pl. XVIII figs. 1-7, Pl. XIX fig. 8). Only two features of the larvae seem to be distinct adaptations to their environment, viz., the divided spines of the tarsi and distal ends of the tibiae, and the strongly-curved, sharply-pointed tarsal claws, both classes of structures being apparently of assistance in moving up and down the steeply-inclined or vertical surfaces of the bromeliad leaves. So little has been done, however, in comparing the minuter details of Odonate larvae that it is not certain that these features are peculiar to *Mecistogaster*. It is also important to note that the larva shows nothing of the hypertrophy of the abdomen which is so striking a characteristic of the imago. This great increase in abdominal length is accomplished only at metamorphosis and is clearly brought out by the figures on Plates XVIII and XIX.

TRANSFORMATION.

As related on page 407 the larvae collected at Juan Viñas were brought to Cartago and placed in glass tumblers. The opening of each tumbler was covered with a piece of netting. In the early days of April, 1910, we noted that some of these larvae showed signs of approaching metamorphosis, so we took care that some leaves of the small bromeliad in each glass touched the netting and thus afforded a means whereby the larva could reach the latter and there attach itself for transformation.

On April 4 larva No. 59 had so attached itself and at 8.15 A. M. the splitting of the cuticle on the thorax began. By 8.30 A. M. the thorax, head, legs, wings and first four abdominal segments were disengaged and hanging from the exuvia which was attached to the under side of the netting; the body of the imago being sustained entirely by the hind end of the abdomen which was still within the exuvia; the wings were about 10 mm. long. At 8.40 A. M. the imago was completely free from the exuvia and clinging to the netting by its legs. In the meantime we had set up our camera in a convenient position in our room; then pinned the netting cover with the exuvia and expanding imago on it to the door of the wardrobe and obtained the photographs which are reproduced as figure 8, Plate XVIII, and figures 1-8, Plate XIX. The imago made its first flight at 1.53 P. M. It lived in captivity until April 11.

Larva No. 55 transformed April 6 and, with the experience obtained from No. 59, we were able to secure photographs of earlier stages in metamorphosis (Pl. XVIII, figs. 3-7). The whole series of figures on these Plates, together with their explanation, may dispense with further description here. As will be seen from an examination of them, the great length of abdomen of the imago is a relatively sudden acquisition and is not foreshadowed by the size of the larva. This may be still more appreciated by comparing our figures with those of the transformations of other Odonata as given, for example, by Latter (1904) and Ward (1910). The decrease in thickness of the abdomen between the stages represented in Pl. XIX, figs. 6 and 7 is also noteworthy.

On page 410 a hypothesis as to the usefulness of this long imaginal abdomen has been suggested.

Efforts to secure a pairing between ♂ 55 and ♀ 59 were unsuccessful.

THE SPECIFIC IDENTITY OF THIS MECISTOGASTER.

In the *Biologia Centrali-Americana* (Calvert 1907, p. 354) I was doubtful as to whether Costa Rican examples of *M. modestus* should be referred to the race *iphigenia* Selys or not. In describing *iphigenia* (from Bogota and Panama) de Selys wrote (1886, p. 22): "La seule différence à noter en comparant ces exemplaires au type [de *modestus*] du Mexique, c'est que dans les deux sexes, la raie humérale interne est réduite à une virgule basale très courte," and on the following page he states, "♀ Le bout des quatre ailes blanc laiteux."

The material now before me is more extensive, so far as Costa Rica is concerned, than that available when the *Biologia* was written and consists of the following imagos:

Costa Rica, Juan Viñas (2 ♂ No. 55 and April 28, 1910, and 3 ♀ Nos. 57, 59, and May 1; also the ♀ by Bruner quoted in Biol. Cent. Amer.), Orosi (1 ♀ by Sr. Picado) and Tuis (1 pair in coitu and 1 ♀ June, 1907, by Mr. C. H. Lankester, forwarded by the late Prof. Biolley and now in the Acad. Nat. Sci., Phila.)

Guatemala, Purula (3 ♂ 3 ♀) and Cubilquitz (1 ♀) cited in Biol. Cent. Amer.

Mexico, Presidio in Vera Cruz (2 ♂ 2 ♀) and Atoyac (1 ♀) cited in B. C. A., Cordoba (fragments of two individuals reared by Mr. F. Knab).

The pair from Tuis and the Juan Viñas male of April 28 have fully colored thoraces and on comparing them with the equally well colored examples from Presidio and Atoyac, the internal humeral ray is no shorter in the former than in the latter. The Juan Viñas female by Bruner has this ray of the same length as the other Costa Rican specimens.

As stated in the *Biologia* volume, page 57, one female from Presidio has the tips of the wings milky, as described by de Selys for *iphigenia*; this female has the pterostigma creamy-

white. The other Presidio female and the Atoyac female have the pterostigma reddish and brownish respectively, but the tips of the wings are not milky. All the Costa Rican females now before me have the veins at the apices of the wings white but in none of them is the membrane of the wing as milky as in the first mentioned Presidio female which has the veins at the apex brownish or blackish. My belief, as expressed in the *Biologia*, p. 57, is that reddish and brownish pterostigmata in this species indicate greater age than a white stigma. None of the Costa Rican females before me have red or brown pterostigmata, although two of the males have them dark brown.

Judged by the length of the internal humeral ray there seems to be no reason for separating the Costa Rican specimens from the Mexican, and as milkiess at the apex of the wings of the females is evidently not a geographical character, whatever else its significance may be, I refer all the Costa Rican specimens to *modestus*.

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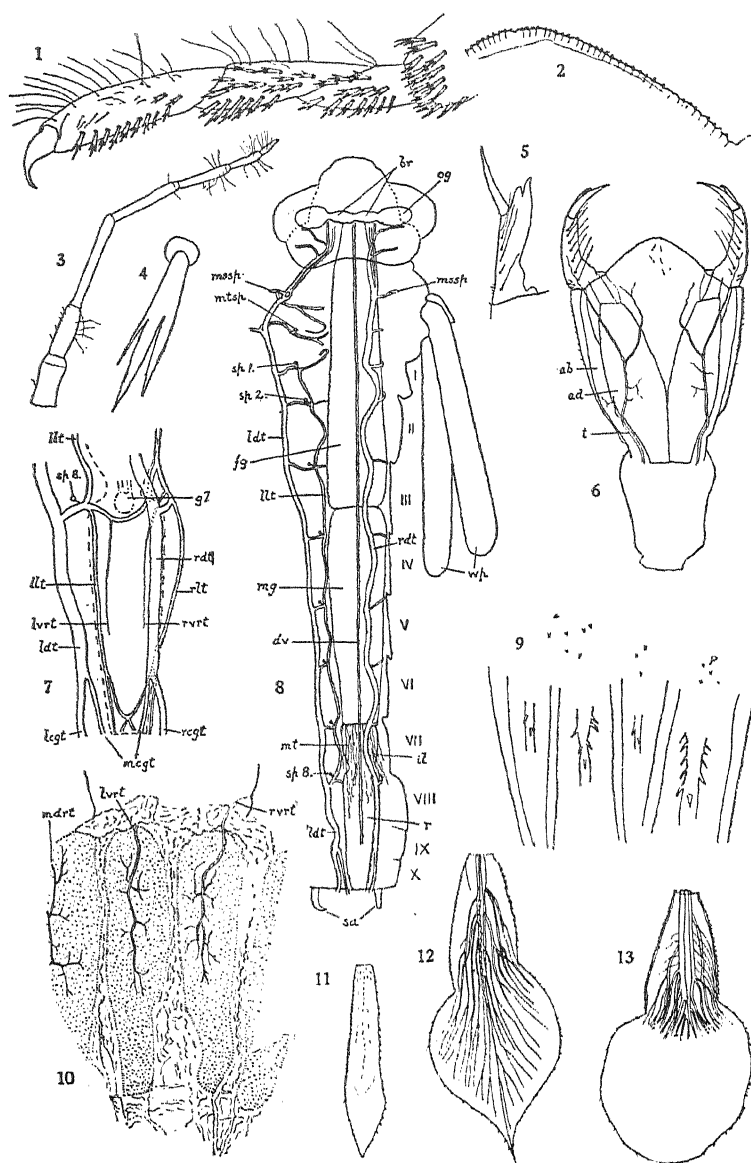
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MECISTOGASTER MODESTUS—CALVERT.

EXPLANATION OF PLATES XVII-XIX.

(All three Plates refer to *Mecistogaster modestus Selys*).

PLATE XVII.

- Fig. 1. Tarsus and distal end of tibia, larva No. 2. x 33.
 Fig. 2. A little more than the right half of distal margin of mentum, dorsal surface, larva No. 1. x 28.
 Fig. 3. Right antenna, larva No. 1. x 18.
 Fig. 4. A single trifold spine from the proximal tarsal joint of fig. 1, length .07 mm. x 370.
 Fig. 5. Lateral labial lobe from exuvia of larva No. 49. x 14.
 Fig. 6. Labium, larva No. 1. x 8.
 Fig. 7. Principal tracheae supplying the rectum, larva No. 1. The outlines of the ileum and rectum are shown by broken lines. The left dorsal trachea (*ldt*) has been turned to the left out of its normal position. x 9.
 Fig. 8. Some of the principal viscera of larva No. 1. The outline of thorax and first seven abdominal segments has been shown on the right side only, the dorsal body-wall being supposed to have been entirely removed from these segments, but its right half retained and spread out to the right in segments 8-10. The dorsal trachea is in normal position on the right (*rdt*), but turned over out of position (*ldt*), and the lateral trachea (*llt*) also exposed, on the left. The dotted lines on the head show the outlines of the compound eyes. x 4½.
 Fig. 9. One-fourth of the gizzard armature as seen when the viscus is cut lengthwise and spread out flat, larva No. 1. x 45.
 Fig. 10. Inner surface of the rectum, larva No. 1, cut lengthwise to the right of the mid-dorsal line and spread out flat. x 16.
 Fig. 11. A caudal gill of larva No. 101. x 9.
 Fig. 12, 13. Caudal gills from larvae Nos. 48 or 49 and 1, respectively. x 9.

All these figures drawn by camera lucida and compound microscope.

Abbreviations:

<i>ab</i> , abductor muscle.	<i>mcgt</i> , trachea to median caudal gill.
<i>ad</i> , adductor muscle.	<i>mdrt</i> , mid-dorsal rectal trachea.
<i>br</i> , brain (cerebral ganglia).	<i>mg</i> , mid-gut.
<i>dv</i> , dorsal vessel.	<i>mssp</i> , mesostigma.
<i>fg</i> , fore gut.	<i>mt</i> , Malpighian tubules.
<i>g7</i> , seventh abd. ganglia	<i>mtsp</i> , metastigma.
<i>il</i> , ileum.	<i>og</i> , optic ganglion.
<i>lcgt</i> , trachea to left caudal gill.	<i>r</i> , rectum.
<i>ldt</i> , left dorsal trachea.	<i>rcgt</i> , trachea to right caudal gill.
<i>llt</i> , left lateral trachea.	<i>rdt</i> , right dorsal trachea.
<i>lvrt</i> , left ventral rectal trachea.	

<i>rlt</i> , right lateral trachea.	2nd and 8th abd. segs.,
<i>rvt</i> , right ventral rectal trachea.	respectively.
<i>sa</i> , superior appendages (cercoids)	<i>t</i> , trachea.
of imago.	<i>wp</i> , wing pads.
<i>sp.</i> 1, <i>sp.</i> 2, <i>sp.</i> 8, spiracles of 1st,	1-X, abdominal segments 1 to 10.

PLATE XVIII.

Figs. 1, 2. Larva No. 55, placed on the netting out of water for comparison.

Figs. 3-7. Larva No. 55, transforming April 6, 1910. Figs 3-5 show the tracheal linings being pulled out of the right thoracic spiracles as white lines.

Fig. 8. Larva No. 59, transforming April 4, 1910, 9.05 A. M. (For continuation of this series see Plate XIX).

Fig. 9. Ventral surface of metamorphic exuvia No. 55.

Fig. 10. Dorsal surface of metamorphic exuvia No. 57. After transformation the exuvial coverings of the gills as they dry become shriveled. In this case special care was taken to spread them out on a piece of paper that they might dry in approximately natural shape attached to the paper.

Fig. 11. Larva No. 57 photographed alive in water, March 2, 1910.

PLATE XIX.

Figs. 1-7. Larva No. 59, transforming April 4, 1910. Between the taking of photographs 3 and 4 the netting was shifted to bring the imago into side-view.

Fig. 8. Metamorphic exuvia of No. 59 after transformation, April 4, 1910, at 10.46 A. M.; 20 mm. long.

All figures on Plates XVIII and XIX from photographs by Amelia S. Calvert.

THE PECKHAM COLLECTION OF SPIDERS.—The Public Museum, of the city of Milwaukee, Wisconsin, has recently received a donation of great value. This is the entire collection of spiders, chiefly Attidae, from all parts of the world, of Dr. George W. Peckham, whose work on Solitary Wasps and Spiders is so well known. The collection includes many thousands of spiders, among them many species determined by Simon. The types, of which a few are still in the collection, will be sent to Cambridge, where the rest of Dr. Peckham's have been sent. Dr. Peckham included his entire library on Arachnida in this donation. He expects to leave shortly for Central America, probably Guatemala, where he will stay for six months.

R. A. MUTTKOWSKI, Milwaukee, Wis.

LARVA NO. 55

FROM
LARVA NO. 59
APRIL 4, 1910
9:05 A.M.

APRIL 6, 1910

APRIL 4, 1910.
9:10 A.M.

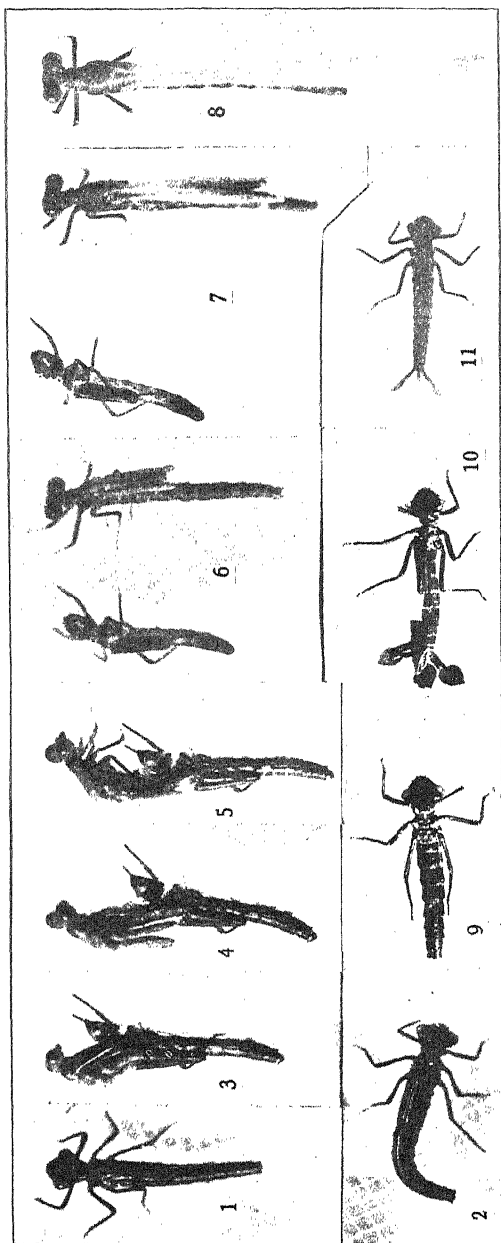
7:25 A.M.

7:27 A.M.

7:40 A.M.

7:44 A.M.

7:53 A.M.



EXUVIA OF
NO. 55

EXUVIA OF
NO. 57

NO. 57
MARCH 2, 1910

LARVA NO. 55
APRIL 4, 1910. 9:20 A.M.

MECISTOGASTER MODESTUS - CALVERT.

10.46 A.M.

10.46 A.M.

10.11 A.M.

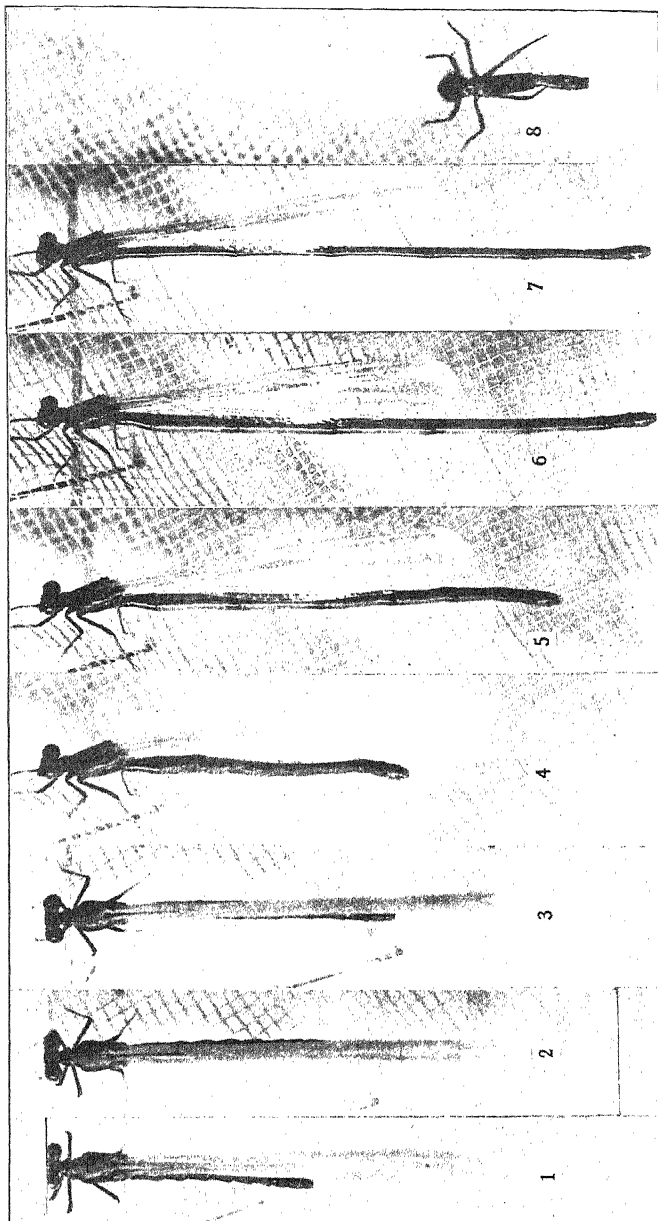
9.58 A.M.

9.48 A.M.

9.45 A.M.

9.20 A.M.

9.10 A.M.



WINGS 46 MM.
ABD. 71 MM.

ABD. 71 MM.

ABD. 58 MM.

WINGS 46 MM.
ABD. 34 MM.

MECISTOGASTER MODESTUS—CALVERT.

Standards of the Number of Eggs laid by Spiders.—I. (Arach.).

Being Averages Obtained by Actual Count of the Combined Eggs
from Twenty Depositions or Masses.

By A. A. GIRAULT, Brisbane, Queensland, Australia.

I. *EPEIRA SERICATA* Clerck. (=SCLOPETARIA Clerck.).

No.	Date 1911	No. counted per mass	Successive Totals	Av. per Egg Mass	Max.	Min.	Range
1	July 22	236	236	236.	300	114	300
2		227	463	231.5			
3		239	702	234.			
4		337	1039	259.7			
5		182	1221	244.2			
6		254	1475	246.			
7		166	1641	234.			
8		247	1888	236.			
9		182	2070	230.			
10		300	2370	237.			
11		279	2649	241.			
12		261	2910	242.5			
13		189	3099	238.			
14		114	3213	229.5			
15		236	3449	230.			
16		292	3741	234.			
17		145	3886	229.			
18		165	4051	226.			
19		153	4204	221.			
20		238	4442	222.			
20		238	4442	222.	300	114	186
							Finals

All of the egg masses of this spider were collected at one time from the sides of windows and beneath the sills, from the under sides of piles of lumber stacked up on the ground, from the sides of wooden structures under projections of all kinds and from other similar situations in a limited area on the western shore of Lake Michigan occupied by an experimental sewage pumping station, Sanitary District of Chicago, Chicago, Illinois. The collection was made during the afternoon of July 22, 1911.

The spider was extremely abundant in this situation, especially along the elevated boardwalks and platforms leading to and from the several experimental sewage filters back of the

plant and bordering on the shores of the lake. Here, after nightfall, their webs were very abundant. An abundance of aquatic dipterous and neuropterous insects in the imaginal stage afforded an ample supply of food. These latter were partly from the sewage and partly from the lake.

Since a single female of this spider probably deposits several or more masses of eggs during its life, the average given should not be taken as the average total progeny of a pair but rather as the approximate average number of eggs per mass.

An *Aleyrodes* on *Euphorbia*, and its Parasite (Rhynch., Hym.).

By T. D. A. COCKERELL, University of Colorado, Boulder,
Colorado.

A short time ago Mr. E. Bethel collected at Glenwood Springs, Colorado, some material of *Euphorbia robusta* badly infested by an *Aleyrodes*. I was able to breed out the adults of the *Aleyrodes*, and also large numbers of an undescribed parasite. This appears to be the first record of *Aleyrodes* on *Euphorbia* in this country, though *A. euphorbiae* Loew was found on *Euphorbia peplus* in Austria. *Euphorbia robusta* is also the food plant of the very interesting moth *Doa ampla* (Grote), which I have bred at Boulder. Dr. Dyar, who kindly determined the moth, will describe the larva.

Aleyrodes pruinus euphorbiarum n. subsp.

Adult ♀.—(measurements in microns). Length of body 1200; head and legs grey, thorax grey with the scutellum light yellowish; abdomen light clear lemon yellow, with the apex broadly grey, and dorsal markings as in *A. pruinus*; eyes completely divided; third antennal joint 160; joints 4 to 7 subequal, all together 224; length of antennae about 432; anterior wing about 1595 long and 640 wide; main vein distinctly angulate beyond middle (about 770 from base), but with no upper branch, though this is represented by a slight fold; anterior wings white with a faint greyish patch in apical field; border of wing as in *pruinus*.

Pupa.—Broad-oval, 1280 microns long, 1040 wide, or sometimes

smaller; nearly black, but variably brownish, becoming brown at sides; usually no fringe of wax, but there is a very easily deciduous fringe in good specimens, about 30 across, finely striate; no dorsal wax; an obscure median keel, and the usual strong transverse sutural marks; a more or less evident pale marginal zone, the edge of which is finely crenulate. Immature specimens are brown. Vasiform orifice triangular; operculum very broad (62 broad and 30 long), truncate apically, much as in *A. amnicola*, except that the sides form a much wider angle with the truncation; lingua 30 broad at broadest part, and extending 27 beyond operculum, the apex broadly rounded, very minutely irregularly beaded, slightly notched on each side just above widest part, below which it rapidly narrows; a dark band crosses the lingua at the widest part.

I had regarded this as a new species, but it was so close to *A. pruinus* Bemis, found on *Heteromcles* in California, that I thought it prudent to send specimens to Mr. Quaintance to be compared with type material of *pruinus*. Mr. Quaintance kindly replies that it seems to be structurally identically with *pruinus*, though there are differences in color. He adds that probably *A. spiraeoides* Quaintance will prove to be conspecific with *pruinus*. *A. spiraeoides*, also from California, has a bright lemon-yellow pupa and the anterior wings of the adult have two dusky spots. On comparing the *Euphorbia* species with the description and figures of *A. pruinus*, it seems to differ in having the pupa flatter (certainly not "very convex"), the vasiform orifice more produced apically, and the operculum different. These characters are, however, somewhat evasive, and it seems probable that the insect does not deserve more than subspecific rank. It is rather contrary to expectation, that the form from the arid interior of the country should be characterized by its extremely dark coloration in the pupa.

The parasite, reared from this species in great numbers, is a member of the interesting group Aphelininae. On looking it up, I found that it would not fit well into any known genus, but combined the characters of *Encarsia* and *Coccophagus*. Specimens were accordingly submitted to Dr. L. O. Howard, who replied: "The truth is, it belongs to a new genus. It has the antennae of *Coccophagus*, but its wing veins are quite different. I suggest that you make a new genus for it."

MIMATOMUS n. gen.

Runs in Howard's table (Bureau of Entomology, Tech. Ser. No. 12, part iv), to *Coccophagus*, having the wings without a hairless line, the antennæ 8-jointed, with the slender club 3-jointed, the stigmal vein well developed, the marginal a little longer than the submarginal, the hind tibiæ normal, etc. The small size and the parasitism on *Aleyrodes* suggest *Encarsia*; so also does the large stigmal vein, which is directed apicad and is without a definite knob. The tarsi are 5-jointed; eyes very distinctly hairy, the hairs quite long; ovipositor projecting very little beyond the abdomen.

Mimatomus peltatus n. sp.

♀—(measurements all in microns). Length 670; width of head 312; length of anterior wing 720, its breadth 312; length of fringe on its lower margin 30; length of submarginal vein 176, of marginal 208, of stigmal 30, end of stigmal vein to end of wing 304; length of antennal club 152; ovipositor projecting beyond abdomen 27. Black, with the scutellum bright yellow, suffused with brown basally, its surface with an irregular coarse network sculpture; wings clear; antennæ ferruginous; legs pale yellowish or ferruginous, the hind femora and coxæ brown. Antennal joints with longitudinal dark lines; scape ordinary; pedicel moderately swollen; funicle joints successively longer, all conspicuously longer than broad; parapsidal grooves straight; axillæ formed as in Howard's figure of *Prospaltella murtfeldtii*; middle tibia 256 long, its spur about three-quarters the length of the basitarsus, but very slender and sharp apically.

ENTOMOLOGICAL THESES FOR DOCTORATES IN AMERICAN UNIVERSITIES.—According to the list of theses offered by those who received the degree of doctor of philosophy from American Universities in 1911, published in *Science* for August 18, 1911, the following bore entomological titles:

University of Chicago, Robert Kirkland Nabours, Mendelian Inheritance in Orthoptera.

Columbia University, Charles Virgin Morrill, The Chromosomes in the Oogenesis, Fertilization and cleavage of Coreid Hemiptera.

Cornell University, Robert Matheson, The structure and Metamorphosis of the Fore-intestine of *Corydalis cornutus* L. Edith Marion Patch, Homologies of the Wing-veins of the Aphididae, Psyllidae, Aleurodidae and Coccidae.

Harvard University, Edward Gaige Titus, Monograph of the species of *Hypera* and *Phytonomus* in America.

University of Cincinnati, Annette Frances Braun, Observations on the Development of Color in the Pupal Wings of Several Species of *Lithocolletes*.

University of Pennsylvania, Norman Eugene McIdoo, Lyriform Organs and Tactile Hairs in Araneads.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, four weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.—Ed.

PHILADELPHIA, PA., DECEMBER, 1911.

There are at least two kinds of sermons, one of them the hortatory. As man is prone to fall into the same evil ways year after year, he must be continually exhorted to reform the same particular bad habit. Herein, we see the chief practical value of sermons hortatory.

So also there are at least two kinds of entomological editorials, one of them the hortatory. Persuaded of the necessity of this sort of editorial utterance, as of the hortatory sermon, we shall make no apology for saying one and the same thing many times in this column, if it appear desirable to do so.

Now we say: Label your insects carefully and fully.

A well-known entomologist writes:

"So much of the material that comes to hand is poorly labeled and it is even common for collectors to send in a lot of specimens to a specialist and expect *him* to label them all in accordance with data given in a letter. Let every man label his own things! (Exceptions may be made for lots of unmounted specimens of the same species)."

In these days when special printers of entomological labels exist and when many have their own micro-printing outfit, there is no excuse for not labeling even a long series of specimens. Each label should bear the name of the locality (nearest town, village or postoffice, if no other exact designation is available)

county, state or country, altitude if not readily and exactly ascertainable from a geographical hand-book, date including year (and the month should *never* be indicated by Arabic numerals, for an American abbreviates October 9, by 10-9, and an Englishman, 9-10,—not that these are unfailing national characters), and the name of the collector as a clue to the specimen's history.

Some insects will require additional information, as to the plant or the nature of the soil, or the species of animal on which they were taken.

No specimen intended for preservation should be ticketed with a number only and all the information separately recorded under that number in a book. The chances are in favor of book and specimen following different paths in the maze of life whereby the specimen soon passes into the limbo of forgotten things.

To recur to the sermon again: What I say unto You, I say unto All—LABEL!

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

MOSQUITOES FED BY ANTS.—The Javanese ant, *Cremastogaster difformis* Smith, excavates its nests in ends of dead branches. When these nests are placed in unfavorable places they become filled with rain-water, and are abandoned by the ants. In this water the mosquito, *Harpagomyia splendens* de Meijere, lays its eggs, and is not known to occur elsewhere than in association with this *Cremastogaster*. Breeding the ants and the mosquitoes together, E. Jacobson found that the mosquitoes spent much time on an upright rod supporting the ants' nests, rocking their bodies gently to and fro, until an ant ran along the rod between a mosquito's legs. The ant was then caressed and produced a drop of liquid between its wide-opened jaws, which was sucked up by the proboscis of the mosquito. The operation is figured by some photographs and drawings on three plates (*Tijdschrift voor Entomologie*, liv, pp. 158-161, taf. 11-13, 1911). In a description of the larva and pupa of this Culicid, following Jacobson's paper, Prof. de Meijere points out, as of special interest, that, although the adult *Harpagomyia* possesses neither mandibles nor maxillae, rudiments of these mouth parts are present in the pupa.

THE MODE OF INFECTION BY THE CAYOR WORM.—Doctors Rodhain and Bequaert conclude, from their observations in the Congo State, that *Cordylobia anthropophaga* (Grünberg) lays its eggs on the ground. The larvae, known generally as Cayor worms, crawl over the soil until they come in contact with man or a mammal, penetrate the skin and lie in the subcutaneous tissue, causing the formation of tumors. On reaching full growth, the larvae leave the host, fall to the ground, bury themselves and there pupate. This Muscid fly is said to be the most common cause of human or animal myiasis in tropical Africa, from Senegal to Natal. In the region of Bas-Katanga where these investigations were made, dogs appeared to be the principal hosts, although *Cordylobia* larvae were found also in guinea-pigs, a monkey and two white men. The larvae are always localized on those parts of the hosts which come in immediate contact with the soil. (Ann. Soc. Entom. de Belgique, lv, pp. 192-197, 1911).

THE OCCURRENCE OF POLYNEMA CONSOBRINUS GIRAULT IN GEORGIA.—Professor A. L. Quaintance, in charge of Deciduous Fruit Insect Investigations, Bureau of Entomology, U. S. Department of Agriculture, had loaned to me some time ago several specimens of species of Mymaridae among which was a female of the above named *Polynema*. The specimen has been referred to in print before as a *Polynema* reared in connection with *Polynema piceipes* Girault (Psyche, 1905, p. 92). Only recently have I been able to identify it. It has been remounted in balsam from a tag and bears the labels, "Fort Valley, Ga. J. H. Beattie, VI, 29, 1905. Quaintance No. 774. Reared in connection with eggs of *Anthonomus quadrigibbus* Say in *Crataegus* fruit." As the species *consobrinus* has been recorded as a parasite of the eggs of *Euchenopa binotata* Say, it is probable that this specimen came from some membracid or jassid egg concealed within the fruit of the hawthorn.

This specimen is worthy of mention not only because it extends the known distribution of the species, but also because it appears to be a variant. Thus, the proximal tarsal joint of the caudal legs is distinctly longer and more slender than usual, the second tarsal joint of the same legs longer than the distal joint, the first joint subequal in length to the combined lengths of the other three joints, facts which are not true for the comparatively large number of specimens of *consobrinus* which I have seen so far. But the relative length of the joints of appendages is by no means constant in Mymaridae, there being considerable variation in some cases and because of this I have little doubt that the specimen under consideration is but a variant and not a distinct species. The discal ciliation of the fore wing in this specimen disappears farther out from the base of the wing than is usual, but this also varies somewhat and has no specific value in this case.—A. A. GIRAULT.

ANTS PARALYZED BY THE SECRETION OF A BUG.—E. Jacobson has observed that a Holoptiline Heteropter, *Ptilocerus ochraceus* Montandon, of Java, possesses, on the underside of the second abdominal segment, a tuft of yellow hair (a trichome), which apparently secretes some substance with a flavor agreeable to ants of the species *Dolichoderus bituberculatus* Mayr. On the approach of one of these ants, "the bug is at once on the alert; it raises half-way the front of the body, so as to put the trichome in evidence. * * * The ant at once proceeds to lick the trichome. * * * At this stage of the proceedings the bug does not yet attack the ant. * * * It is surprising to see how the bug can restrain its murderous intention as if it was knowing that the right moment had not yet arrived. After the ant has indulged in licking the tuft of hair for some minutes the exudation commences to exercise its paralyzing effect. * * * As soon as the ant shows signs of paralysis by curling itself up and drawing in its legs, the bug at once seizes it with its front legs and very soon it is pierced and sucked dry." (Tijdschrift voor Entomologie, liv, pp. 175-179, 1911). An accompanying paper by the late G. W. Kirkaldy describes and figures the *Ptilocerus*.

PARASITIC ORTHOPTERA.—The rareness of the parasitic habit in this order of insects makes additional information concerning it very welcome. The most famous Orthopterous parasite is *Hemimerus*, for which de Saussure proposed the formation of a new order—Diploglossata. Prof. Dr. Richard Heymons, of the Royal Museum fur Naturkunde, at Berlin, describes his observations on the habits of *Hemimerus talpoides* Walk. in Heft II of the Deutsche Entomologische Zeitschrift for 1911. Dr. Heymons kept in a cage, an East African hamster-rat, *Cricetomys*, infested with 20-25 *Hemimeri*. The behavior of these insects with relation to their host, light and food is discussed at length, and the conclusion is drawn that *Hemimerus* can be considered as neither injurious nor useful to its host. It is not regarded as a parasite in the narrower sense of the word, because it does not injure the rat. On the other hand, the idea of Jordan (1909) that *Hemimerus* and *Cricetomys* are symbionts and that the former benefits the latter by consuming fungi found on the skin of the mammal, is rejected. Heymons, indeed, found spores of fungi in the alimentary canal of *Hemimerus*, but he believes that their occurrence there and on the exterior of the host is incidental to the habits of life of *Cricetomys*. The principal food of *Hemimerus* is the upper horny epidermis of its host, but as the insect not infrequently leaves the rat for short excursions, it consumes other things in addition, Heymons finding plant-cells and chitinous pieces in its digestive tract. *Hemimerus* is quiescent while its host is ac-

tive, and the insects seemed to seek the inguinal region of Heymon's *Cricetomys* at such times, but when the rat was sleeping or quiet, wandered over all parts of the body, rarely attracting any response from the rat. Heymons agrees with Hansen (1894) in considering that *Hemimerus* is most nearly related to the Forficulidae—earwigs—and in this connection it is worth while to mention the discovery, within the last two years, of an earwig, *Arixenia esau*, found in the breast pouch of a naked bat in Sarawak, described by Dr. K. Jordan in 1909, and exhibited at the Entomological Society of London, Feb. 2, 1910.

A RAT-FLEA AS THE INTERMEDIATE HOST OF TAPE-WORMS.—The dog-flea and the human flea have long been known to serve as hosts of the cysticeroid stage of the tape worm *Dipylidium caninum*. Dampf recently found a Cysticeroid, supposed to be that of *Hymenolepis nana*, in the flea, *Mesopsylla cuncta*, from the jerboa, *Alactaga jaculus*. Nicoll and Minchin have now found two species of Cysticeroids in the body cavity of the rat-flea, *Ceratophyllus fasciatus*.

One of these Cysticeroids has been proved to be the larval form of *Hymenolepis diminuta*; it "occurred in about four per cent. (8 in 207) of all the fleas examined during a period of thirteen months. It was found in the body cavity and usually only one specimen at a time. As many as three, however, had been found in one flea." Feeding experiments to determine the identity of the Cysticeroid were performed on a litter of young rats, separated from their mother, isolated, and kept under observation until it was certain that they were free from tape-worms. After three months, fleas were mashed up with their food, and nineteen days later mature tape-worms (*Hymenolepis diminuta*) and their ova were found in the intestine of the rats and in the rats' faeces respectively. It is thought that only the oldest and largest flea-larvae are capable of ingesting the tape-worm eggs and that no development of these eggs takes place until the beginning of the pupal stage.

Of the other Cysticeroid, only one specimen has been found in *Ceratophyllus fasciatus*. From a microscopic examination and comparison with the known tape-worms of rats, "the authors were forced to the conclusion that this Cysticeroid must either be referred to *Hymenolepis murina* or to some other as yet undescribed form, the scolex of which was indistinguishable from that of *H. murina*." This discovery is of special interest; first, because it has been believed that *H. murina* dispensed altogether with an intermediate host, passing its encysted stage in the walls of the intestine of the rat itself; second, because some have considered *H. murina* to be identical with *H. nana*, a dangerous tape-worm of man; and third, because no inter-

mediate host has yet been discovered for *H. nana*. "Rats certainly ingested a large number of fleas from time to time, but it was difficult to imagine that they would acquire a very large infection with *H. murina* by this means; and if *H. nana* be identical with *H. murina* it was scarcely conceivable that a human being could accidentally swallow a sufficient number of fleas to give rise to an infection of over a thousand tape-worms, as was frequently found to be the case. It would still, therefore, be necessary to admit that the development of *H. murina* usually took place without an intermediate host, but that occasionally the rat-flea might function as such. With such a conclusion the life-story of *H. murina* became even more remarkable than before." (Proc. Zool. Soc., London, 1911, part I, pp. 9-13, with figures of the two Cysticeroids.)

MEANS OF TRANSPORTING FUNGI BY THE AMBROSIA-BEETLES.—In the current volume, No. 7, of *Entomologische Blätter* (which describes itself as an International Monthly for the Biology of European Beetles with special reference to Forest Entomology), Strohmeier describes and figures in halftone some of the very curious bunches of bristles to be found on the heads of the females only of various species of Platypodidae. As in certain species (*Mitosoma* sp.) he found clumps of Ambrosia fungus always adhering to the bristles, he infers that the latter serve to transport the fungus from one place to another. In conclusion he remarks that in a very large number of Platypodidae, perhaps in more than half of all the species, a special apparatus for the transport of fungus is lacking. Why are not all Platypodid females so provided? To answer this question it is necessary to glance at the habits and character of the food of these beetles. According to the mutually confirmatory researches of Hubbard* and Neger† the fungi of different Ambrosia beetles are different, the species of fungus depending not on the kind of tree in which the beetle lives, but on the species of beetle. It therefore results that the introduction of the fungus into new brood-tunnels must be brought about—unconsciously of course—by the beetle itself. Dr. Neger has shown that the fungi which are associated with the German species of *Xyleborus* and *Xyloterus* discharge their spores not as dust but in slimy balls, which easily adhere to the unevennesses of the elytra and to the hairs. A fungus with such peculiarities requires no special apparatus for its transport on the part of its symbiotic beetle. Only when the fungus is wholly or in part unable to be attached to the beetle does the need of some special modification of the insect arise.

* The Ambrosia beetles of the United States. Bull. No. 7, U. S. Dept. Agric., 1897.

† Aus der Natur IV, p. 921, 1908. Zeitschr. f. Land- u. Forstwirtschaft, 1908, p. 274. Zentr. Bact. Par. Abt. II, Bd. XX, p. 279.

To the Entomological Research Committee the Natural History Museum owes a beautiful enlarged model of the tropical rat-flea (*Xenospylla cheopis*), which appears to be the main vehicle in the conveyance of bubonic plague to the human subject. The species is believed to have been a native of North Africa, but is now practically cosmopolitan. The model is about 12 inches in length. (*Nature*, July 13, 1911).

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), excluding Arachnida and Myriapoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted. This (*) following a record, denotes that the paper in question contains description of a new North American form.

For record of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

- 2—Transactions, American Entomological Society, Philadelphia. 4—The Canadian Entomologist. 6—Journal, New York Entomological Society. 7—U. S. Department of Agriculture, Bureau of Entomology. 9—The Entomologist, London. 10—Nature, London. 11—Annals and Magazine of Natural History, London. 12—Comptes Rendus, L'Academie des Sciences, Paris. 14—Proceedings, Zoological Society of London. 21—The Entomologist's Record, London. 22—Zoologischer Anzeiger, Leipzig. 35—Annales, Societe Entomologique de Belgique. 40—Societas Entomologica, Zurich. 50—Proceedings, U. S. National Museum. 68—Science, New York. 72—Transactions, Kansas Academy of Science, Topeka. 84—Entomologische Rundschau. 92—Zeitschrift für wissenschaftliche Insektenbiologie. 102—Proceedings, Entomological Society of Washington. 107—Revista, Museu Paulista, S. Paulo, Brazil. 152—California Agricultural Experiment Station, Berkeley. 159—Bollettino, Laboratorio di zoologia generale e agararia della R. S. Superiore d'Agricoltura in Portici. 179—Journal of Economic Entomology. 180—Annals, Entomological Society of America. 198—Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass. 251—Annales, Sciences Naturelles, Zoologie, Paris. 271—Fauna Artica, herausgegeben von Dr.

F. Romer und Dr. F. Schaudinn, Jena. 346—Fauna Exotica, Mitteilungen aus dem Gebiete der exotischen Insektenwelt, Frankfurt am Main. 348—State of Connecticut Geological and Natural History Survey, Hartford, Conn. 349—Zoologische Annalen, Zeitschrift für Geschichte der Zoologie, Würzburg.

GENERAL SUBJECT. Bethune-Baker, G. T.—"The latest in nomenclature," 21, 1911, 263. Britton, W. E.—Guide to the insects of Connecticut, Pt. I, 348, Bul. No. 16, 38 pp. Gillett, J. A.—Insects feeding on "slime flux" of trees, 10, 1911, 516. Gregory, J. W.—The scientific misappropriation of popular terms (mentions insects), 10, 1911, 538-541. Luederwaldt, G.—Os insectos necrophagos Paulistas, 107, viii, 414-533. Pocock, R. I.—On the palatability of some British insects, with notes on the significance of mimetic resemblances; with notes upon the experiments by E. P. Poulton, 14, 1911, 809-868. Prout, L. B.—Descriptions or figures? 21, 1911, 263-265. Scudder, S. H.—Obituary by H. J. Turner, 21, 1911, 255-256. Obituary by T. D. A. Cockerell, 68, 1911, 338-342. Shelford, R.—Sparrow v. butterfly, 21, 1911, 245. Silvestri, F.—Contributo alla conoscenza dei mirmecofili del Messico, 159, v, 172-195 (*). Smith, J. B.—Report of the Entomological Department of the N. J. Agr. College Exper. Station, New Brunswick, N. J., for the year 1910, 300-424 pp.

APTERA AND NEUROPTERA. Hilton, W. A.—The structure of the central nervous system of *Corydalis* larva, 180, 1911, 219-256. Navas, L.—Neuropteros del Brazil por el Reo Padre, 107, 476-481. Parker, W. B.—California redwood attacked by *Termes lucifugus*, 179, 1911, 422-423. Silvestri, F.—Contributo alla conoscenza dei Machilidae dell'America settentrionale, 159, v, 324-352 (*). Materiali per lo studio dei Tisanuri. Un novo genere e undici specie nove di Japygidae dell'America settentrionale, 159, v, 72-87 (*). Wodsedalek, J. E.—Phototactic reactions and their reversal in the may-fly nymphs *Heptagenia interpunctata*, 198, xxi, 265-271.

ORTHOPTERA. Allar, H. A.—Studying the stridulations of Orthoptera, 102, 1911, 141-148. Shelford, R.—The latest in nomenclature, 21, 1911, 241-242. Walden, B. H.—The Euplexoptera and Orthoptera of Connecticut, 348, Bul. No. 16, pt. 2, 39-169 pp.

HEMIPTERA. Barber, T. C.—The Coccidae of Louisiana (2d paper), 179, 1911, 448-451. Crumb, S. E.—The Jassoidea of Kansas, 72, xxiii, 232-238. Gahan, A. B.—Notes on two important parasites of economic insects (*Telenomus quaintancei* & *Alphidius nigripes*), 179, 1911, 423-425. Heidemann, O.—Some remarks on the eggs of N. A. sp. of Hemiptera-Heteroptera, 102, 1911, 128-140. A n. sp. of N. A. Tingitidae, 102, 1911, 180-181 (*). Hempel, A.—

Descripcao de um novo genero e uma nova especie de coccidas, 107, viii, 52-53. **Leonardi, G.**—Contributo alla conoscenza delle cocciniglie della Republica Argentina, 159, v, 237-284. **Lindinger, L.**—Beitrage zur kenntnis der schildlaus und ihrer verbreitung, II, 92, 1911, 244-255 (cont.). **Martelli, G.**—Notizie sull'Aphis brassicae, e su alcuni suoi parassiti ed perparassiti, 159, v, 40-54. **Matausch, I.**—The effects of parasitic castration in Membracidae, 6, 1911, 194-196. **Silvestri, F.**—Sulla posizione sistematica del genere Termitaphis, con descrizione di due specie nuove, 159, v, 231-236. **Smith, P. E.**—Specific characters used in the genus Pseudococcus, 180, 1911, 309-327.

LEPIDOPTERA. **Banks, C. S.**—A manual of Philippine silk culture, Department of the Interior, Bureau of Science, Manila, 53 pp. **Barnes & McDunnough.**—New species and genera of N. A. Lepidoptera, 6, 1911, 151-162 (*). **Bethune-Baker, G. T.**—Lepidopterology, 21, 1911, 271. **Bordas, L.**—L'appareil digestif et les Tubes de Malpighi des larves des Lepidopteres (suite et fin), 251, xiv, 193-273. **Bryk, F.**—Apollinische liebe, 40, 1911, 50-52. **Chapman, T. A.**—Lepidopterology—no description of a species valid without a figure, 21, 1911, 239-240. Viviparous butterflies, 21, 1911, 233-234. **Forbes, W. T. M.**—A structural study of the caterpillars, II: The Sphingidae, 180, 1911, 261-279. **Grossbeck, J. A.**—Utetheisa bella var. nova, 6, 1911, 196-198. **Hampson, G. F.**—Descriptions of new genera and species of Syntomidae, Arctiidae, Agaristidae and Noctuidae, 11, 1911, 394. **Hormuzaki, C. F.**—Die systematische und morphologische stellung der bukowiner formen von Melitaea athalia und M. aurelia, 92, 1911, 213-218. **Michael, O.**—Lebensweise und gewohnheiten der Morpho des Amazonasgebietes. Beobachtungen uber vorkommen und lebensweise der Agriasarten des Amazonasgebietes, 271, i, 13-20 (cont.). **Pierce, F. N.**—Viviparity in Lepidoptera, 9, 1911, 309-310. **Pocock, R. I.**—The distastefulness of Anosia plexippus, 10, 1911, 484-485. **Prell, H.**—Biologische beobachtungen an Termiten und Ameisen, 22, 1911, 243-253. **Reiff, W.**—Experimente an uberwinternden Lepidoptera-puppen, 92, 1911, 235-237 (cont.). **Smith, J. B.**—New species of Noctuidae for 1911, No. 1, 6, 1911, 133-151 (*). **Strand, E.**—Eine neue, riesenhafte Gelechiide aus Ecuador, 84, 1911, 151. Zwei neue sudamerikanische formen von der lepidopteren-familie Riodinidae (Erycinidae), 84, 1911, 150. **Walker, E. M.**—Rare captures of Lepidoptera, 4, 1911, 340. **Wolley-Dod, F. H.**—Further notes on Alberta Lepidoptera, 4, 1911, 329-339.

DIPTERA. **Bezzi, M.**—Restauratione del genere Carpomyia (Rond) A. Costa, 159, v, 2-33. **Felt, E. P.**—Three new gall midges, 6, 1911, 190-193 (*). Hosts and galls of American gall midges.

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HYMENOPTERA. **Brethes, J.**—Quelques nouveaux Ceropalides du Musee de Sao Paulo, **107**, viii, 64-70. **Chapman, T. A.**—Showers of peppercorn oak-galls, in England, **21**, 1911, 214. **Cornetz, V.**—Das problem der ruckkehr zum nest der forschenden ameise, **92**, 1911, 218-223 (cont.). **Gahan, A. B.**—A note on Xylo-

crabro stirpicola, 179, 1911, 431. Girault, A. A.—Descriptions of No. American Mymaridae with synonymic and other notes on described genera and species, 2, xxxvii, 253-324 (*). Miscellaneous notes on the Hymenoptera Chalcidoidea: the genus *Arthrolytus*; *Ilorismenus microgaster*, 4, 1911, 346-354. Notes on the Hymenoptera Chalcidoidea, with descriptions of several n. g. and sp., 6, 1911, 175-189 (*). A new Mymarid genus and species from N. A. allied with *Anthemus*, 102, 1911, 185-187. von Ihering, R.—Algunas especies novas de *Vespas solitarias*, 107, viii, 462-475. Knab, F.—How *Emphor* drinks, 102, 1911, 170. Lozinski, P.—Ueber einen eigentumlichen nestbau von *Osmia bicornis*, 92, 1911, 223-230 (cont.). Macgillivray, A. D.—New species of *Empria*, II: Western Species, 4, 1911, 341-346 (*). Marchal & Feytaud.—Sur un parasite des oeufs de la *Cochylis* et de l'*Eudemis*, 12, 1911, 633-636. Meissner, O.—Ameisen und Ameisenlowen, 84, 1911, 151-152. Rohwer, S. A.—New sawflies in the collection of the U. S. National Museum, 50, xli, 377-411 (*). Santschi, F.—Formicides de diverses provenances, 35, 1911, 278-287. Schmidt, A.—Neue Aphodiinen und eine synonymische bemerkung, 40, 1911, 52-53 (cont.). Schrottky, C.—Descripcao de abelhas novas do Brazil e de regioes visinhas, 107, viii, 71-88. Ichneumonidarum species quatuor novae, 159, v, 35-36. Schulz, W. A.—Zweihundert alte Hymenopteren, 349, iv, 1-220. Silvestri, F.—Della *Trigona cupira*, e di due aspidi del suo nido nel messico, 159, v, 65-69. Szepligeti, G.—Zwei neue Braconiden aus Brasilien, 159, v, 285-286. Trotter, A.—Contributo alla conoscenza delle galle dell'America del Nord, 159, v, 100-133 (*). Turner, C. H.—Experiments on pattern-vision of the honey-bee, 198, xxi, 249-264. Wood, H. P.—Notes on the life history of the tick parasite (*Hunterellus hookeri*), 179, 1911, 425-431.

A Manual of Philippine Silk Culture. By Charles S. Banks (from the Entomological Section, Biological Laboratory, Bureau of Science, Manila, Philippine Islands), 53 pages and 19 plates.

The introduction of silk culture into these islands, if it could be made a profitable industry, would be very desirable. This work is intended to collate data and interest those who may wish to take up the commercial production. "The Bureau of Science made the first attempt to import and to propagate mulberry silkworms into the Philippine Islands six years ago." A historical account is given of the attempts of the missionaries in the early eighties and also of the later efforts. The life history of the species is given in detail. An account is also given of the eri or castor silkworm (*Attacus ricini*) and of the wild silkworms of the islands. The proper "silk house" is described and also the varieties of mulberry and their cultivation. The manufacture, reeling, etc., and the quality of silk is also discussed.

In summing up the author says "We have now carried on a sufficient number of experiments with both mulberry and eri silkworms in the Philippines to warrant the statement that this industry can be carried on here under conditions as favorable as those which obtain in the best silk producing countries of the world and with the added advantage that no disease has appeared among the insects, or on the trees used for feeding them." The work is a very useful one and will doubtless stimulate an interest in the subject.—H. S.

THE EUPLEXOPTERA AND ORTHOPTERA OF CONNECTICUT. By Benjamin Hovey Walden. Bull. No. 16, Connecticut State Geol. & Nat. Hist. Survey, Guide to the Insects of Connecticut, pt. II, pp. 41-169, Pls. VI-XI, 63 text figures. 1911.

The author of the above paper and the editor of the Guide to the Insects of Connecticut, Dr. W. E. Britton, are to be congratulated on the appearance of this very interesting and useful work. In an introduction of three pages the author reviews previous work which had been done on the Connecticut Orthopterous fauna, as well as giving such acknowledgements and abbreviations of collectors' initials as are necessary. The systematic treatment is comprehensive, with keys to the genera and species and diagnoses for each, while the distribution within the state is summarized in the more generally distributed forms and the localities indicated in the scarcer and more localized forms. The arrangement is in accordance with Scudder's 1900 Catalogue, while the keys of genera and species are chiefly from Morse and Blatchley.

The numerous text figures, a portion of which are original, assist very greatly in a clear understanding of the text, making the work of value to the specialist as well as to the local student.

The number of species treated is one hundred and nine, of which one hundred have been recorded from the state, the remaining nine being included on the probability of their occurrence within the state.

From the nomenclatural standpoint the names are not in all cases those used by most authors at this date, i.e., *Tettix* instead of *Acrydium*, *Stenobothrus* instead of *Chorthippus*, *Locustidae* instead of *Tettigonidae*, and *Xabea* instead of *Neoxabea*, but this is probably due to a close adherence to Scudder's Catalogue, although other recent changes, as *Blattella* for *Phyllodromia*, have been made.

The general character of the work is excellent and it will stand with Blatchley's Orthoptera of Indiana as the best type of a state catalogue of insects, more of which we hope will be forthcoming in the future.

The only suggestion we can make for the authors of such works in the future, and one based on considerable experience in mapping the distribution of Orthoptera, is that enough localities be cited for

even the commonest and most widely spread species to enable those studying the distribution of species in a comprehensive fashion, to utilize such records in their own work. Frequently a general statement of distribution must later, when more evidence is in hand, be qualified by zonal or environmental restriction. (J. A. G. R.)

Doings of Societies.

FELDMAN COLLECTING SOCIAL.

Meeting of June 21st, 1911, at 1523 South Thirteenth Street, Philadelphia. Fifteen members present. Mr. John Green, of Easton, Pa., visitor. President Hainbach in the chair.

Dr. Skinner described his recent visit to the Carnegie Museum in Pittsburg, Pa., where he studied the Edwards collection of Lepidoptera. He said he had had his doubts as to the validity of certain species which Edwards described and mentioned one, as being satisfactorily placed by himself before studying the type material; *Pamphila viris* which is a topomorph, a northern form of a California species described by Boisduval. The collection as a whole is very poorly arranged.

He also said that *Nodonota puncticollis* Say (Col.) has been very destructive to rose bushes at Ardmore, Pa., since 1909, eating everything but the roots. Dr. Dixon had reported it to him as feeding this year on the tops of red oaks at Black Rock Farm, Gladwyn, Pa.

Mr. Daecke exhibited a box of several orders of insects showing the diversity of one day's catch at Inglenook, Pa., May 30, 1911, and pointed out the following as interesting: *Leptura octopunctata* Say, and *Toxotus trivittatus* Say (Col.) both found on *Viburnum acerifolium* Linn. the former common and the latter rare, saying they were so thickly covered with pollen as to look like lumps on the flower; *Emmisa labiata* Say (Col.) one specimen; a Microlepidopter, a species of *Micropteryx*, and the following Diptera: *Coenomyia ferruginea* Scop., *Xiphura fumipennis* O. S., *Nephrocerus daeckii* Johnson (of which there are only six specimens known), *Laphria sericea* Say

(quite common) and several Syrphids. A shrub, *Hydrangea arborescens* Linn. along a path seems to be the favorite feeding place of *Trichius bibicus* Oliv. (Col.).

Mr. C. T. Greene exhibited and recorded the following Diptera: *Nephrocerus dacckii* Johnson, Roxboro, June 10, 1911, and *Temnostomia pictula* Williston, same place, June 11, 1911, both collected by himself.

Mr. Hoyer exhibited several specimens of a species of Platyptera, *Chauliodes fasciatus* Wlk., saying it was very common along Cobb's Creek west of Sixty-ninth Street, May 28th.

Meeting of September 20th, 1911, at 1523 South 13th Street, Philadelphia, President Haimbach in the chair, thirteen members present.

Mr. Daecke mentioned a trip to Hunter's Run, Pa., July 2, 1911, where, although the place had been burned over, collecting was very rich. Among the rarities were *Neoclytus scutellaris* Oliv. on oak, and *Leptura emarginata* Fab. (Col.)

Mr. Harbeck described the trip taken by himself and Mr. C. T. Greene this year to Pocono Lake, Pa., the week of July 9th, to collect Diptera, saying that many species rare here are common there, and many of those common there are not found here at all. A box of various orders was exhibited.

Mr. Hoyer said that two specimens of *Goes tigrina* De G. (Col.) had been taken flying around a house in the neighborhood of Haines and Chew Streets, Germantown, Philadelphia, about July 8th.

Mr. Schmitz said that at Anglesea, September 3, he had witnessed the nuptial flight of ants which lasted about an hour, from 6 to 7 P. M. He had seen a Mantis *Paratenodera* feeding upon a Cicada.

Mr. C. T. Greene exhibited and recorded the following Diptera from Pocono Lake, Pa.: *Pyrophæna granditarsus* Förster, VII, 12, and *Sericomyia militaris* Walker, VII, 11, both collected this year by himself and thinks they are the first records from this State.

Mr. H. A. Wenzel described in detail his trip to Texas with

Mr. Green, of Easton, and the hardships they encountered there. Photographs and colored cards of some places visited were shown, also the material so far mounted, among which were sixteen specimens of *Plusiotis woodi* Horn and two of *P. gloriosa* LeC., the latter being about half the size of those taken in Arizona.—GEO. M. GREENE, *Secretary*.

AMERICAN ENTOMOLOGICAL SOCIETY.

Meeting of June 12, 1911. Dr. Philip P. Calvert, president, in the chair. Eight persons present.

Mr. Cresson reported the death of Mr. J. W. McAllister, on May 28th, aged seventy-five years. He was an organization member, and served many years as a member of the Finance Committee.

The death of John Meichel, a member, who died in October, 1909, was announced.

The President reported the death of S. H. Scudder, on May 17th. He was elected a member of the Society, October 14, 1861.

Dr. Skinner made some remarks on the destructiveness of *Nodonota puncticollis* in Montgomery County, Pa.

Dr. Calvert exhibited four excellently preserved fossil wings of the dragonfly *Phenacolestes* from Florissant, Colorado, sent by Prof. T. D. A. Cockerell for study. This genus belongs to the legion Podagrion of De Selys. As far as the speaker had been able to compare these fossils with living forms, they showed a greater number of resemblances to the genera *Philogenia*, of Costa Rica and Tropical South America, *Megapodagrion* of Tropical South America and *Argiolestes* of Celebes, New Guinea and Australia than to any others known to him.

Meeting of October 26, 1911. Dr. Philip P. Calvert, president, in the chair. Twelve persons in attendance.

Mr. Wenzel referred to some remarks made by Dr. Skinner

at the last meeting of the Feldman Social, on the destruction of hickory trees at Ardmore, Penna., by a bark beetle and said an illustrated article on the subject of the destruction of trees of this species had appeared in the issue of "Country Life in America," for October 15th.

Mr. West exhibited specimens of *Catocala*, among them being the beautiful *C. nivea* from Japan; also some Pierids in Denton glass mounts.

Mr. Rehn exhibited a specimen of *Acridoxena hermaniana*, a peculiar Locustid from the Cameroons, West Africa, and a pair of *Corycus abruptus*, another Locustid, from tropical Africa. The latter species exhibits great sexual dimorphism, the male tegmina being enormously inflated and modified into sounding boards for the tympanum, while in the female the tegmina are single, vertical and unmodified.

Mr. E. T. Cresson, Jr., exhibited a specimen of *Clanoneurum* (Diptera) which he determined as *infumatum* Becker, and said it was curious that the species occurred in America as it was identical with specimens described from Egypt under that name. He gave a history of the genus, which was erected for the Egyptian *infumatum* of Becker. A species from the Balkan region has also been described by Strobl, and Czerny found a form in Spain and suggests that they are all the same species. The speaker coincided in this opinion, having found a representative in Arizona and Southern California, which in every respect agrees with Becker's description of *infumatum*.

Dr. Calvert made a communication on Bromeliad insects found in Costa Rica (published in the News for November and December).

Mr. C. T. Greene reported the capture of *Trichopoda lanipes* at Castle Rock, Penna.

Mr. Andrew Gray Weeks, of Boston, presented some engravings of the late W. H. Edwards and S. H. Scudder.

The Curator reported that the work of removing the insects to temporary quarters began yesterday, and that it would take a week to remove everything in the entomological rooms.—

HENRY SKINNER, *Recording Secretary*.

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